

Canada

AND HER NEIGHBOURS

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Canada

AND HER NEIGHBOURS

REVISED

An aerial photograph of a large dam and reservoir. The dam is a long, curved structure made of stone or concrete, separating a large body of water (the reservoir) from a smaller body of water (the river). The reservoir is on the left, and the river is on the right. The dam has a road or walkway on top. In the background, there are hills and some buildings. The overall tone is sepia or aged black and white.

By GRIFFITH TAYLOR

DOROTHY J. SEIVERIGHT

and TREVOR LLOYD

GINN AND COMPANY
TORONTO



Nova Scotia Film Bureau

About the Title Page

The Canso Causeway carries both a highway and a railway between Cape Breton Island and the mainland of Nova Scotia. Because the sea is so deep here, the Canso Causeway had to be almost thirty feet deeper than the height of Niagara Falls. At the north end a canal through the causeway allows ships to pass. It is crossed by a swing bridge.



B.A. Oil Photo

About the Cover

Elk Lake is found in the Rocky Mountains not far from Banff. The geologists in the foreground came to look for minerals and found beauty all around them. The rocks at which they are looking were formed beneath the waters of a sea many millions of years ago. What an upheaval there must have been, to raise these rocks so high!

Our World and Ourselves

This book is the first in a series of geographies which will carry you all over the world. From it you will learn first about Canada, our own country, and then about our nearest neighbours, the United States and Alaska.

"What is geography," you may ask, "and why should we study it?" Geography is one of the interesting and important sciences that explain *how* people live in different parts of the world and *why* they live as they do. It helps us to understand our world and the people who live in it.

To understand how other people live, in different parts of Canada and in other lands, you must first know how *you* live and why you live as you do. How can you do this? Here are a few ideas to help you.

First, learn to open your eyes to *see* what lies about you and *be curious* about what is being done in your own neighbourhood and why. For instance, when you walk or drive through the countryside, can you give the names of the trees, flowers, and birds that you see? Do you know what crops are being raised, and why? Have you any idea where these crops are used? What kind of fences separate the fields from one another? Of what materials are the houses built? Are any of these produced nearby? What is made in the factories you pass? Where do the railway tracks and highways lead to? These are only a few questions; there are many, many more which will occur to you once you really begin to open your eyes.

One of the best ways to understand, first your own surroundings and then other parts of our country and the world, is to collect what we may call "geographical yardsticks." For instance, on the page opposite the Canso Causeway is said to be deeper than the height of Niagara Falls. But how high

are these falls? The answer is about 150 feet. Again, how high is that? Now it is your turn to answer. Find out the height of your school flagpole or some nearby building, tree, or landmark. How does this compare with the height of Niagara Falls?

The same is true of distance. When you read that it is 167 miles from Quebec to Montreal, what does this mean to you? When you are out driving, notice how long it takes to drive five miles, or ten. This will help you to calculate how long it would take to drive, at about the same speed, from Quebec to Montreal.

Area, too, must have some real meaning to you. You will read that Canada is 3,843,144 square miles in area. How large is one square mile? Your arithmetic text will tell you that a square mile contains 640 acres. But how large is an acre? You are familiar with the size of your schoolyard. Find out its area. Is it larger or smaller than an acre? How many schoolyards of that size would be needed to make up a square mile?

Another "yardstick" that we need is the length of the day. You read, for instance, that crops grow very fast in the long summer days near Edmonton. How long is a long day? To answer this you must know the time of sunrise and sunset where you live. Some newspapers give this information daily. If you cannot find what you want in this way, make your own observations and keep a daily record for June and again for December, the months which have the longest and the shortest days of the year. If the time between sunrise and sunset is longer than twelve hours, the day is long. As you may already know, all of Canada, by this measurement, has long summer days and short winter days. However, the difference between the length of day and night in Southern Ontario and

that at the mouth of the Mackenzie River in the far north is very great.

The length of the *growing season* is another necessary "yardstick." The growing season is the length of time between the last killing frost in the spring and the first in the fall. If you read that the growing season at a certain place is 90 days — or 150 — this means little unless you know how long the season is where you live.

In the same way you need "yardsticks" for yearly rainfall and for summer heat and winter cold. You cannot gather and become familiar with all these yardsticks at once, but if your curiosity is great enough, you will soon learn. The chief point to remember is to go back always to conditions where you live, to compare them with those conditions about which you are reading.

Direction, too, is something about which you should be certain. Often we hear newcomers to a place say, "I am all turned round here." No one needs to be "turned round." If you happen to be a boy scout or a girl guide, you probably know how to find direction by reading a compass, but there is a simpler way to find north. Go outdoors on a fine day at exactly noon (at one o'clock if Daylight Saving Time is in force). Every fence post or telephone pole, in fact every upright object, is at that time throwing a shadow which points directly north. No matter where you are, or at what season of the year you try this experiment, so long as you remain in the Northern Hemisphere, this is true.

In addition to the "geographical yardsticks" which you must gather for yourself, there are various helps to learning provided for you in the text. Perhaps the two most important are pictures and maps.

Pictures are not merely something to look at and admire. They have been carefully

chosen to give you a better understanding, or clearer *concept*, of conditions in the various places about which you are reading. Study them carefully, compare what they show with what you see in the part of Canada with which you are familiar. Ask yourself questions about them, then try to find answers to your questions.

Maps speak a language of their own. This language must be learned step by step. Be curious about every sign and symbol shown on a map. They help you to understand the story which the map has to tell. If you gain a good understanding of the early maps in this book, it will help you greatly to understand those which come later on.

Other helps to learning are the index, and the "statistics," or lists of population, area, etc., which are found at the back of the book. The statistics are included for purposes of comparison, not to be memorized. For instance, if you are reading about Hamilton, Ontario, and you want to find out how it compares in population with your home town, or with that of some other city of which you have read, turn to the statistics and you can easily satisfy your curiosity.

Someone has said that "An index is the key to the world which the book opens up." Learn how to use it as soon as possible, since it will save you much time. It not only tells you where to find information on various places and topics, but it shows you how to pronounce correctly all place names used in the book. It is much easier to learn the correct pronunciation of a word the first time you meet it than to be obliged later to correct a wrong pronunciation.

Now that you have found out about the various helps at hand to serve you in studying geography, you are ready to turn the page and enter into a new world. The authors wish for you a good year and happy learning.

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Canada

AND HER

NEIGHBOURS

REVISED



NORTH AMERICA

Cities over 1,000,000 ———— ■
Selected cities under 1,000,000 ———— ●
Capital Cities ———— ◆

10,000 FT.
3,000 FT.
1,000 FT.
SEA LEVEL
BELOW SEA LEVEL

MAP SCALE: ABOUT 630 MILES OR ONE INCH

0 250 500 750 1000 1250



Courtesy of Canadian National Railways

Leaving Halifax for our trip across the country.

CANADA AS A WHOLE

It was early in September, and John and Bill were talking after their first day at school.

John. "What do you suppose, Bill? They say we are to study Canada in Geography this year. We had such fun learning about how people live in faraway lands, and now this year we have to study Canada. I don't see what fun there can be in that. I would like to learn about China, or India, or some other country that we don't know all about anyway."

Bill. "But Canada, that's our *own* country; we ought to know a lot about it."

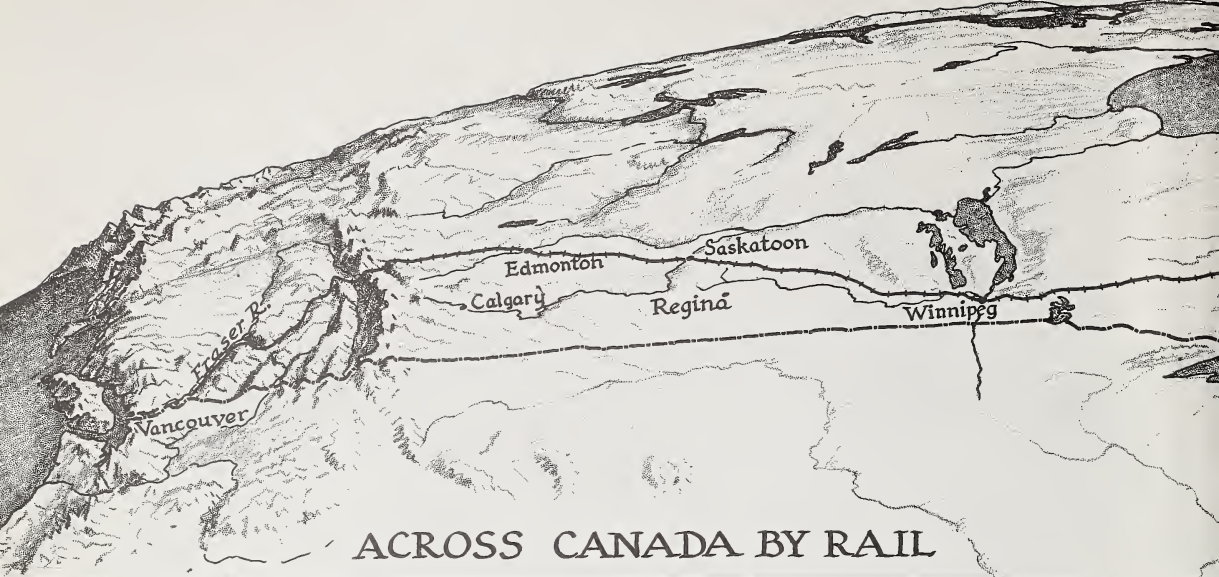
John. "That's just it. We know all about Canada already, and there's nothing strange or different about us anyway."

Bill. "I don't know, John. The other day I heard my father talking to a man from Europe. This man said, 'What a wonderful

country Canada is — so large, so new, so rich, so beautiful'; and my dad said, 'Yes, that is true, it is a large and wonderful country; but it is so large many Canadians never get to know it as they should.' I, for one, should like to find out much more about this country in which we live."

A JOURNEY FROM SEA TO SEA

Halifax to Montreal • Can you remember what you were doing last Monday morning at 10:00 o'clock? Just about that time a train was leaving the station at Halifax, on the eastern mainland shore of Canada. Find Halifax on the map. Let us suppose that you are aboard the train. As you leave Halifax you notice the many large ships in the harbour, for Halifax is an important port and the ships sail to and from all parts of the world. Halifax is in Nova Scotia. Just before



ACROSS CANADA BY RAIL

lunch time you cross the border of Nova Scotia and enter the Province of New Brunswick. All day you travel through New Brunswick, and you will guess from the thick forests on either side of the railway that lumbering, that is the cutting of trees, is a kind of work important to this province.

In the evening you cross the border of New Brunswick and enter the Province of Quebec. If you should happen to waken about 3:00 o'clock in the morning, you might put up the blind and find yourself on the bank of a great river, the St. Lawrence. On the cliffs of the opposite shore there is the

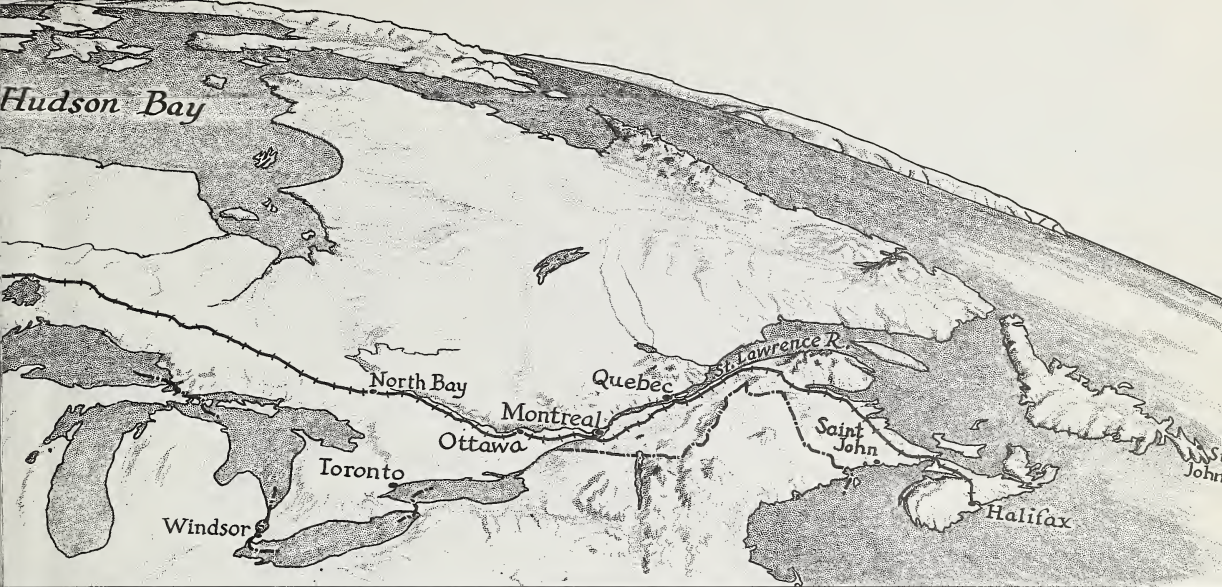
city of Quebec standing high above the river. If you are not too sleepy, you may notice the farms of Quebec as the train journeys on along the valley of the St. Lawrence, and you will understand that farming is important to Quebec. At Montreal you get off the train and have breakfast. Find Montreal on the map. You have been on the train nearly 24 hours, and yet you have travelled through only a small part of Canada! You can understand one reason for calling Canada a great country!

The train from Montreal for the West does not leave until the afternoon, and so you

Our train follows the Restigouche Valley through the wooded hills of New Brunswick.

Courtesy of Canadian National Railways





have time to look around this great city. No doubt the first thing you will notice is the mountain, Mount Royal, from which Montreal gets its name. It rises in the centre of the city. It was to the top of this mountain that Jacques Cartier, an explorer sent out by the King of France, climbed more than four hundred years ago. Montreal is now a busy manufacturing centre and the largest city in Canada.

Through Ontario • In the afternoon you board another train and in about two hours' time pass through Ottawa, the capital of our country. From the train windows you can

get glimpses of the city and its fine buildings. You are now in the Province of Ontario. All Tuesday night and most of Wednesday you travel through Ontario. As the railway crosses the northern part of the province, you miss the busy cities to the south. From the train windows you see forests, rocks, and swamps, or *muskeg*. The forests are important to Ontario. From the trees comes the lumber which is used for building. From other trees is made the paper on which this book is printed. In the rocks are many valuable metals — iron, gold, nickel, and dozens of others which bring great wealth to

Quebec as we see it from the opposite shore of the St. Lawrence River.

Courtesy of Canadian National Railways





U. S. S. R.
(RUSSIA)

Arctic Sea

Bering Strait

Point Barrow

Beaufort Sea

Mould Bay

Queen Elizabeth Islands

Ellesmere Island

Thule

Baffin

Baffin

Victoria Island

ALASKA

Yukon R.

YUKON

Arctic Circle

Aklavik

Inuvik

Tuktoyaktuk

Port Radium

Great Bear Lake

Fort Norman

Yellowknife

Great Slave Lake

Gulf of Alaska

Whitehorse

Skagway

Juneau

Ketchikan

Prince Rupert

Queen Charlotte Islands

British Columbia

Alberta

Saskatchewan

Manitoba

Northwest Territories

Yukon

Northwest Territories

Rankin Inlet

Northwest Territories include all islands in Hudson Strait, Hudson Bay, and James Bay

Hudson Bay

Churchill

Manitoba

Alberta

British Columbia

Columbia

Pacific Ocean

Edmonton

Yellowhead

Calgary

Medicine Hat

Saskatoon

Regina

Winnipeg

Brandon

Port Arthur

Superior

Duluth

St. Paul

Minneapolis

Madison

Des Moines

Chicago

CANADA

- Cities over 1,000,000 —————>
- Cities of 300,000-1,000,000 —————•
- Cities of 100,000-300,000 —————•
- Selected cities under 100,000 —————o

National Capitals

Other Capitals

RAILROADS —————

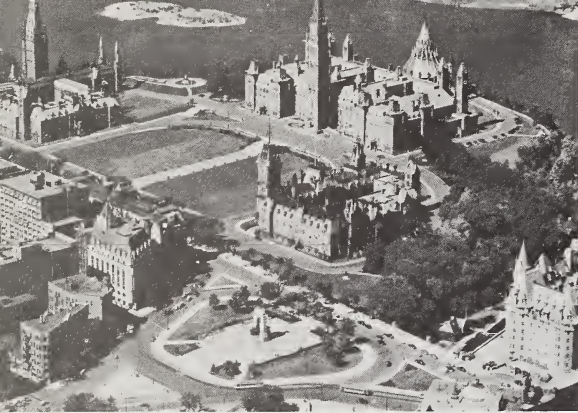
SEA LEVEL

BELOW SEA LEVEL

MAP SCALE: ABOUT 300 MILES TO ONE INCH

0 100 200 300 400 500 600





Royal Canadian Air Force Photograph



Massey Harris



Courtesy of Canadian National Railways

Other sights along our way: the Parliament Buildings in Ottawa; cutting wheat in the Prairie Provinces; Mt. Robson towering above our train in the Rockies.

Canada. You may be able to see from the train windows some of the mines from which these metals come.

About 9:45 at night you reach Winnipeg, the capital of Manitoba. You left Halifax on Monday morning. It is now Wednesday evening, and you are only about half way across Canada from east to west. Truly, it is a great country!

Prairies and mountains • On and on the train goes. All night you are passing great wheat fields, and Thursday morning you reach Saskatoon, in the Province of Saskatchewan. Before lunch time you are in Alberta, and late that afternoon you catch your first glimpses of the snow-capped Rocky Mountains. What a thrill these towering peaks give you, after the miles and miles of plains! As the train climbs and winds, you cannot help wondering at the many sights. Most surprising perhaps are the cliffs of rough rock rising more than a mile in some places from the side of the railway track. Why are there so few people living here?

Journey's end • In the morning you are still in the mountains. Thick forests cover the lower slopes, and between the mountain ranges are green valleys. For much of the journey the train follows a fast-flowing river. The water seems to boil and turn to spray as it strikes against the rocky banks. Bit by bit the river widens and appears more quiet, but like your train it is sliding swiftly to the sea. At last you enter the broad green valley of the lower Fraser River. After the wild mountain scenes, the sight of well-cared-for fields and grazing cattle tells you that you must be nearing a place where more people live. Yes, you are right. You have almost reached Vancouver and your journey's end. Monday morning to Friday noon on the train — nearly four and a half days — yes, Canada is a great country! Even so, you have not crossed the whole of Canada, since you have seen nothing of the island province of New-

foundland. Find a picture of the "Coat of Arms" of Canada. On it are some Latin words which mean "from sea to sea." Are they true of Canada?

It is about this great sea-to-sea country that we shall read in this book. We shall learn that Canada is not only great in size but great in importance in the world. We shall find out why this is so.

THE DISCOVERY OF CANADA

The early explorers • Who first found Canada? How long has it been known to the white man? These are questions which cannot be answered for certain. Nearly a thousand years ago men from Norway, called Norsemen, voyaged to this side of the Atlantic Ocean and when they returned home told of visiting "The Land of the Vine." This may have been the mainland of Canada, it may have been Newfoundland, or it may have been the United States, but one thing is certain: they "discovered" America about five centuries before Columbus.

Five hundred years later John Cabot sailed from England to the shores of Canada, seeking a new way to China. Cabot was disappointed with the rocky coast which he found. He saw no living soul, and soon returned to England. He died, not realizing that the land he had found would yield as great riches as any of the storied countries of the East.

About forty years later Jacques Cartier made two voyages for France. On the first voyage he visited some of the islands in the Gulf of St. Lawrence. On the second voyage, a year later, he sailed up the broad St. Lawrence River as far as the Indian village, Hochelaga, where Montreal now stands. Later he spent the winter at Quebec. It is said that Quebec is an Indian word meaning "narrows." The city is located at the first narrow place in the St. Lawrence River.



© Haskell Coffin. A mural by Haskell Coffin in the New York Telephone Company Building, Ogdensburg, N. Y.

Jacques Cartier, the famous French explorer, discovering the St. Lawrence River.

Champlain and the first colony • In 1603 Samuel Champlain sailed from France to explore Canada. He travelled up the St. Lawrence River as far as Montreal. Above Montreal he found rapids where the river flowed swiftly over ledges of rock, making it impossible for his ships to go further. These rapids were one of the reasons for the growth of Montreal. Montreal was said to be at the "head of navigation," since it was as far as most ocean-going ships could sail. With the building of the St. Lawrence Seaway, the rapids have disappeared. Ocean-going freighters can now sail as far inland, or away from the ocean, as the head of Lake Superior.

The following year Champlain returned to the new land with his fellow-countryman, the Sieur De Monts, and a group of Frenchmen. They planned to found a colony, that is make homes for themselves in this country. On St. John's Day they saw a broad river



The sharp peaks and wooded valleys of the Rockies make western Canada famous for its scenery.

A fishing cove in Newfoundland. Can you find the racks where fish are drying?





A lake freighter leaving dry dock at the Lake Ontario end of the Welland Canal.

Skiing in the Laurentians. Notice the forested hills and ice-covered lake.





The provinces and territories of Canada.

flowing into the sea. This, Champlain named the St. John River. At its mouth now stands the city of Saint John.

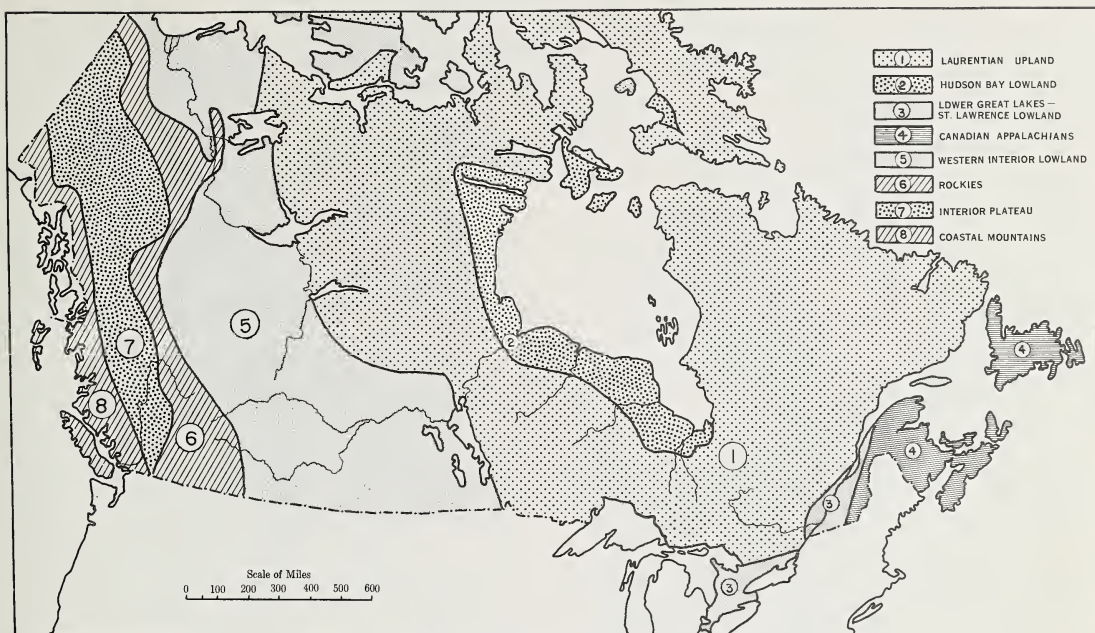
Further west along the coast De Monts and his party landed and built a fort at the mouth of a river now known as the St. Croix. Today this river forms the boundary, or border, between New Brunswick and the United States. However, the tiny island on which the fort was built was a poor place for a colony. As winter came the explorers found they had no hills to protect them from the bitterly cold winds which blew from the north. In the spring, therefore, they looked for a better place and chose a fine protected bay, the Annapolis Basin in Nova Scotia; and to this spot they moved their colony.

The native people • The early explorers found in Canada a people who were strange to them and whose language they did not understand. These were the Indians. It is natural, therefore, that we have in Canada many place

names which come to us from the Indians. Wabana, Chicoutimi, Saskatchewan, and Miramichi are some. Indeed the name Canada itself is said by some people to come from an Indian word.

THE PHYSICAL REGIONS OF CANADA

Two kinds of mountains • As you can well imagine, a great country like Canada is not everywhere the same. Some parts are rocky and mountainous, while others are level or rolling plains. Look at the map on page 13. In the west you will find young mountains with sharp peaks. Such mountains are said to be *rugged*. The mountains along the coast are called the *Coast Range*, and those farther inland include the *Selkirks* and the *Rocky Mountains*. Among the pictures on pages 10-11, find one which shows you the steep slopes and peaks of these mountains. It is easy to understand now why they are said to be rugged, or rough. They look as if they had



The physical regions of Canada.

been there for a very long time. Indeed they have, but they are not nearly so old as the mountains in the eastern part of Canada. Rain and snow, wind, frost, and ice have been at work wearing down these western mountains, but they have not yet had time to round off the sharp peaks or to fill in the deep valleys between them.

In the eastern part of Canada are old, worn-down mountains, quite unlike the rugged mountains of western Canada. They have rounded tops and gentle slopes. Also, because they are lower, snow does not cover them all the year round. These mountains were high and rugged long ages ago, no doubt much higher than the Rocky Mountains are now. But ice, snow, rain, frost, and wind have through the ages worn them down. These worn-down mountains of the eastern part of Canada are called the *Appalachians*. In Newfoundland they are known as the *Long Range*. The map of North America on

page 2 shows you that these same mountains continue into the United States. The rugged mountains along our western coast also continue southwards into the United States.

The uplands and plains - For two thousand miles towards the northwest from Labrador stretches the Canadian Shield, a region, or part of the country, containing thousands of lakes and low, rounded hills covered here and there with trees. This area is shown on the map above as the Laurentian Upland, and that is the name that we shall use in this book. The rocks of which this region is made are among the oldest in the world. Much of this upland is a low *plateau*, or almost level plain formed of very old rocks. The southern edge of the upland just north of the St. Lawrence River is often called the Laurentian Mountains. A hollow in the centre of this upland is filled by the waters of Hudson Bay.

To the west of the Laurentian Upland, and

between it and the Rocky Mountains, Canada is made up of plains that are in places higher than the upland. These plains stretch into the United States as far south as the Gulf of Mexico. See the map on page 192. The part of the plains that is in Alberta is not flat, but is gently rolling and includes some hilly country. Farther east, in Saskatchewan, some of the region is almost flat. A line running from near Winnipeg to the mouth of the Mackenzie River divides these plains from the Laurentian Upland.

Two other plains that are shown on the map are the one through which the St. Lawrence River flows on its way from the Great Lakes to the sea, and the one bordering Hudson Bay and James Bay. Locate these plains on the map on page 13. What are they called? Still another plain borders Lake Ontario, Lake Erie, and Lake Huron.

When we divide a country into plains, plateaus, and mountains, we speak of these divisions as *physical regions*. Look at the map on page 13 and locate carefully each of the physical regions of which you have read.

THE PROVINCES OF CANADA

You have learned that the surface of Canada can be divided up into a number of physical regions which are shown on the map on page 13. Canada is also divided into provinces. The ten provinces were formed to make it easier to govern Canada. They are shown on the map on page 12.

The map of provinces is called a *political* map. It shows you that a large part of Canada lies north of the ten provinces. This northern area is divided into two parts; the western part is called Yukon Territory, and the remainder is called Northwest Territories. Provinces and territories are spoken of as *political divisions*. Make a list of the twelve political divisions of Canada shown on the map on page 12. Which of the provinces includes most of the rugged mountains shown

on the map on page 13? How many different physical regions can you discover within the boundaries of Ontario? Which of our territories and provinces do you pass through in following the Great Plains region from the Arctic Sea to our southern boundary? See the maps on pages 12 and 13.

From now on you will be using the map of physical regions and the map of provinces in learning about life in our country.

THE POPULATION OF CANADA

When we speak of the *population* of a country, we mean the sum of all its people. Thus Canada is said to have a population of over 18,000,000. You will learn, though, that there are areas in which very few people live, and others in which a great many live. In parts of Ontario and Quebec many people live closely together, while in the Northwest Territories one can travel many miles without seeing a single person.

Now that you know how the surface of Canada changes from coast to coast, you can understand one reason why people live more easily in some regions than in others. As you read about the different regions of Canada, watch for other reasons why there are many people in certain parts of Canada and not in others.

A RAINFALL MAP • The map on page 15 shows where rainfall in Canada is heavy and where it is light. As you look at the map some regions are shown in lighter colours than others. These are the regions where rainfall is light. The lighter the colouring, the lighter the rainfall. The parts shown in yellow on the map receive very little rainfall. Those shown in orange receive more, but the rainfall there is still light. The areas in blue receive more rainfall; the darker the shade of blue, the heavier the rainfall. Locate the place where you live. Is the rainfall there heavy or light? In Canada rainfall is measured in inches. The water from melted snow is included in "rainfall." On a yardstick measure the number



of inches of yearly rainfall where you live. If it all fell at one time, this rainfall would cover the land around you with that depth of water.

MAP STUDY • Study the map on pages 6-7. It tells quite a different story from those told by the maps on pages 12 and 13. Look at the western part of Canada, where we learned that there are young, rugged mountains. This map shows these mountains in colours of tan and red. Now look at the “key” in the corner of the map

and see how many feet above sea level is the land that is coloured tan. (Ask your teacher to help you to find out how high your home town is above sea level.) What is the name of the highest range of mountains which you crossed on your trip across Canada? Near Vancouver you will see that the map is coloured in green. From the key find out what this means. Is there much low-lying land in British Columbia? If you took a boat trip along the coast of British Columbia,

and looked towards the mainland, what kind of land would you see?

Now look at the old, worn-down Appalachian Mountains in the eastern part of Canada. How high are they? Are they as high as the mountains in the west? Find the highest part of these mountains just south of the St. Lawrence River. The highest peak is named for Jacques Cartier, who discovered that river.

Find the Laurentian Upland on the map on page 13, and then find it on this map. Is it all high land? Find as many parts of this region as you can that are shown in green. Find the highest parts of the Laurentian Upland. Now try to remember that, whether the land is high or low, this great region has the same hard old rocks and rounded hills.

Next find on the map on pages 6-7, the plains between the Laurentian Upland and the Rocky Mountains. What a surprise we have! They are not low like the plain near Vancouver, but high; as high as many parts of the Laurentian Upland; as high as much of the Appalachian Mountains.

What a plain really means then is that it is flat, or gently rolling, although it may not be low.

Many plains, of course, are low. Let us find as many as we can in Canada. There is the plain south of Hudson Bay. It is very low and swampy. Then there is the St. Lawrence Lowland; it is low too. If you look at the population map on this page you will discover something else about that plain. It looks as if that must be an important part of Canada. The last of the Canadian plains, bordered by Lake Ontario, Lake Erie, and Lake Huron, has both high and low land.

A QUIZ • See how quickly you can find the answers to these questions:

1. Which is higher above sea level, Montreal or Edmonton?
2. On which plain is each found?
3. Which has higher land, Vancouver Island or Prince Edward Island?
4. What part of Newfoundland is highest above sea level?
5. Which province has the most high land? Which province has the most low land?

Where people live in Canada. Compare this map with the one on page 13. In which physical region do people live in largest numbers?





RCN Photo

The harbour of Halifax and Dartmouth. Notice the naval vessels in the foreground.

THE ATLANTIC PROVINCES

The four provinces of Newfoundland, Nova Scotia, New Brunswick, and Prince Edward Island are almost completely surrounded by water. Because of their location they are called the *Atlantic Provinces*. Newfoundland, "Britain's oldest colony," became Canada's newest province in March, 1949. The other three Atlantic Provinces are called the *Maritime Provinces*, for the word "maritime" means "by the sea." As you can see from the map of Canada, the Atlantic Provinces are the smallest of all the provinces. About the same number of people live in the four of them together as live in the city of Montreal and the small towns which closely surround it. As you read on, try to find the reason why more people do not live in these provinces. What special kinds of work are done by people who live near the sea?

THE PHYSICAL REGIONS

The surface of the land • The difference between rocky coasts and fertile valleys where crops can be grown is seen everywhere in the Atlantic Provinces. These provinces are part of a low, hilly region which stretches southwards into the United States. This is known as the Appalachian Region (see the map on page 13). In all this area rocks stand out in many places. In the hilly parts, the rocks are often bare or covered with a shallow layer of soil, but in the valleys the soil is deeper and often very fertile. This is especially true in the valleys of the main rivers, where farming is generally successful. Since there is plenty of rainfall, we find great natural forests in Newfoundland, New Brunswick, and Nova Scotia, even where there is little soil.

From the map you will have discovered

that most parts of the Atlantic Provinces are near the ocean. The northern part of New Brunswick borders on Quebec Province for a distance of only about one hundred miles. Look at the map again, and you will notice that on the west, New Brunswick is partly cut off from Quebec by the State of Maine. You can see, too, that each of the Atlantic Provinces is entirely or partly cut off from the others. On the map find the land boundary between New Brunswick and Nova Scotia.

Before you study further, turn to the map of the Atlantic Provinces on pages 22-23, and do the following map work.

A REGIONAL MAP • The map on pages 22-23 is called a *regional* map because it shows only one region of Canada — the Atlantic Provinces. It shows the country much as it would look from high above the earth with a light shining on it. How wrinkled and worn the world looks! That is in truth just how it does look. The higher parts

of the land appear almost white on the side towards the light, while the side away from the light is in dark shadow. The plains are low and do not catch much of the light. They appear as a darker, even shade. The darkest parts of all are the steep cliffs, which slope down sharply from the light into deep shadow. Notice the deep valleys worn down by some of the rivers. Notice too how the railways keep to the plains and the river valleys when possible. Can you explain why?

MEASURING DISTANCE • In one corner of your map you will see a line called "Scale of Miles." Place a strip of paper along this scale, with one end on the 0. With a pencil make a dot on your paper opposite 50. That means that on this map every distance as long as from the left end of your paper to the dot is 50 miles.

Now, using your piece of paper with its distance of 50 miles, see if you can find any place in Nova Scotia that is 50 miles from the sea.

If you look carefully at the map, you will see that a long arm of the sea almost cuts Cape Breton Island in two. What is the farthest that you can be from the sea on this island?

One of the largest pulp and paper mills in the world, at Corner Brook, Newfoundland. The log boom is being towed to the mill.





The rocky shore of southern Nova Scotia. Notice lobster traps at left. What evidence of a tide do you find in the picture?

Steep hill slopes and blue water make beautiful scenery in Cape Breton. The road is the Cabot Trail followed by thousands of tourists each summer.



In the same way measure the width of Prince Edward Island. Notice that deep bays almost cut the island into three parts.

Except in some parts of New Brunswick and Newfoundland, the people of the Atlantic Provinces are always near the sea, and in one way or another many of them depend on the sea for a living.

COMPLETE THE FOLLOWING SENTENCES • Using the map on pages 22-23 choose the right word to complete these sentences.

1. The smallest of the Atlantic Provinces is — ? —.

2. A body of land almost surrounded by water is called a *peninsula*. The narrow neck of land joining a peninsula to the mainland is an *isthmus*. The greater part of Nova Scotia is — ? — (a peninsula; an island; an isthmus).

3. Cape Breton Island is a part of the Province of — ? —.

4. Labrador is a part of the Province of — ? —.

5. The boundary line dividing Nova Scotia from New Brunswick crosses a narrow neck of land called an — ? —.

6. The Bay of — ? — is south of New Brunswick.

7. — ? — Bay is north of New Brunswick.

8. — ? — Strait is between Prince Edward Island and the mainland.

9. The Strait of — ? — is between Newfoundland and Labrador, and — ? — Strait is between Newfoundland and Cape Breton Island.

10. The two Atlantic Provinces which have the most high land are — ? — and — ? —.

11. The name of the cape at the southeast corner of Newfoundland is — ? —.

12. The — ? — Peninsula in the southeast of Newfoundland is one of the best farming regions of the island.

EARLY SETTLEMENTS

The first settled part of Canada • Of the four Atlantic Provinces, Newfoundland and Nova Scotia were discovered first, for it is believed that Cabot landed on their shores in his search for China. It is likely though, that Norsemen, or Vikings as they are sometimes called, landed here five hundred years earlier.

Cabot told of the large numbers of codfish to be caught in the waters along the coast of these provinces. From that time on, fishermen visited the shores of Newfoundland and parts of Nova Scotia every summer. Cape Breton Island, which forms part of the Province of Nova Scotia, was named for the Breton sailors who came to its shores from the province of Brittany in France.

When Jacques Cartier sailed westward across the Atlantic in 1534, he was not sailing unknown seas. Instead, he followed a well-known route and went at once to Cape Bonavista, on the east coast of Newfoundland, a point well known to fishermen.

The first settlements in Newfoundland were made along the east coast by English fishermen. Later, French fishing stations were set up on the south coast. In 1713 Newfoundland became a British colony. More than a century later, it earned the right to govern itself. It thus became a self-governing colony, as Canada had become not long before. In 1949 Newfoundland joined Confederation and became Canada's tenth province.

As you have read, De Monts and his men were the first to attempt settlement in Nova Scotia. As Champlain sailed along the south shore of the peninsula, he found a rocky coast with many bays and headlands. Although he saw many fine harbours, he found this coast too open to the ocean and decided to continue his search for a more protected location. When he sailed around the western end of the peninsula, he found stretches of low-lying fertile land. The first settlement, as you have read, was made on Ile St. Croix, at the mouth of the St. Croix River. The winter proved too difficult for the settlers and many died. In the spring De Monts moved those who were left across the Bay of Fundy and founded Port Royal where Annapolis Royal stands today.

About twenty years after Champlain left, Nova Scotia was granted by the King of

England to a Scotsman, Sir William Alexander, who gave it the name which means "New Scotland." The Scots made no lasting settlement, and for almost one hundred years more, the land was held by the French, who made a few small settlements. In 1713 the colony passed into the hands of the English, who began slowly to settle the country.

New Brunswick and Prince Edward Island were settled later than Nova Scotia and Newfoundland. When the United States became a separate country, many people living there wanted to remain British. They left their homes and moved to Canada. These people, called Loyalists, formed the largest group in New Brunswick.

THE FISHING INDUSTRY

Getting a living from the sea • When people get their living from a special kind of work, that work is called an industry. From the first, fishing has been an important industry in Newfoundland and Nova Scotia. Those



Near Annapolis Royal stands the replica, or copy, of the Port Royal "Habitation" which was erected on this site in 1605.

who settled along the Atlantic coast of both provinces found rocky ledges, either bare or with thin soil. This meant that they had to get a great part of their living from the sea. Luckily for them there were many deep bays

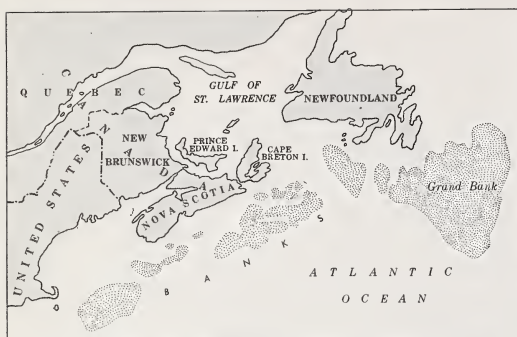
A Newfoundland fishing village. Notice the sheltered harbour and the racks for drying fish.

National Film Board Photograph









The location of the chief fishing banks of the North Atlantic Ocean.

which made sheltered harbours for fishing boats. Then, too, not far from the shores of these provinces are some of the finest fishing grounds in the world. Cod, haddock, herring, and many other kinds of fish are found in large numbers in the cool waters all around the four Atlantic Provinces.

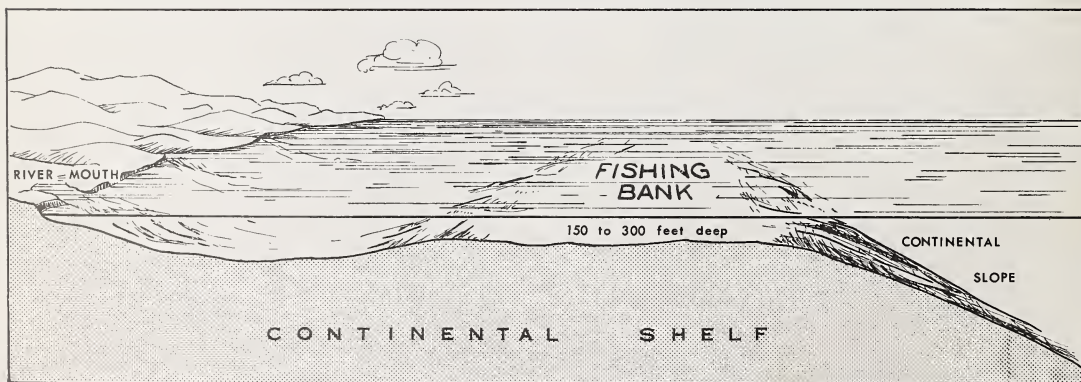
The continental shelf and the Grand Bank • Along the northeastern part of the continent of North America is what is known as a *continental shelf*. Here the land dips gently beneath the sea, so that for some miles out from shore the water is not very deep. Near the edge of the continental shelf there is a ridge. Beyond this the bottom of the ocean slopes more steeply. Fishermen call this line where the steep slope begins the “drop off.”

On the higher parts of the continental shelf the fish gather. There, in shallow water, they find a better supply of food. These higher parts are called fishing “banks.” The largest of all the banks is off the shores of Newfoundland and is called the *Grand Bank*. The cold Labrador Current, which comes from the north, provides food for fish. Most of the more important kinds of fish which are used for food do well in cold water, for it is there that they find the small plants and animals on which they feed.

By an agreement among the nations, the great fishing banks off the coasts of Nova Scotia, Newfoundland, and eastern United States are for the use of all nations. Here are the world’s greatest cod-fishing areas, which also yield large numbers of haddock and halibut. Cod, haddock, and halibut are what are called “bottom-feeding” fish. At certain times of the year they come to the banks and are caught when they are feeding on the bottom. Other fish, such as mackerel and herring, swim near the surface in great “schools,” and when they *migrate*, or move from one part of the ocean to another, they are caught by the fishermen in large nets.

People of the sea • As the early explorers reported, the eastern coast of the Atlantic Provinces is very rugged and rocky. Against

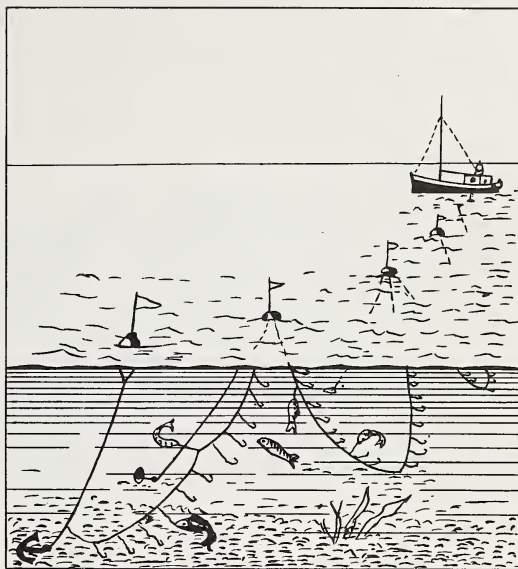
The continental shelf off our Atlantic coast.



this rocky coast break the waves of the open ocean. But, like the Norwegians, the people of the Atlantic Provinces have many bays and harbours in which their boats are safe, and where they can catch bait, mend their nets, and dry their fish. The people of the Atlantic Provinces, and especially the people of Newfoundland and Nova Scotia, are great fishermen and sailors. All along the coast of these provinces you will see fishing boats and fishing nets; and if you want to hear real stories of the sea, you will creep up quietly when a group of "banks" fishermen are telling "yarns." Fishing is a full-time job for them. They are deep-sea fishermen, and the "banks" about which you read are their fishing ground. These men of the sea sail from such ports as St. John's, Placentia, and Grand Bank in Newfoundland, and North Sydney, Louisburg, Halifax, Canso, Lunenburg, and Liverpool in Nova Scotia.

Deep-sea fishing • Let us board one of the large fishing boats anchored in the harbour of Lunenburg. Our boat is called a *dragger*. It is a steel and wooden ship with powerful engines. On the *bow*, or front of the ship, we read its name and home port, *The Fisherman's Hope*, Lunenburg, N.S. Captain Zinck is the master of *The Fisherman's Hope*. On the deck is a lot of special *gear* needed for fishing. Most important of all are great nets used for catching the fish and bringing them into the *hold*, or storage room, below the deck. Everyone on board a dragger works hard, the captain tells us. He says too that we shall see thousands of fish when we reach the banks.

One by one the ships set out, and soon the whole fishing fleet is headed out of the harbour to open water. The smaller boats in the fleet use trawl lines of strong cord, usually over a mile in length. All along this line, about four or five feet apart, are tied other lines about three feet long, to each of which are attached several hooks. Each hook is hidden in a piece of fish, which is the bait. The



A diagram showing how a trawl line is set out, with its many hooks and its wooden floats.

captain selects the location which he decides is best. When the ship has reached the place chosen, the trawl line is thrown from the back, or *stern*, of the boat into the sea. Wooden floats are soon seen bobbing up and down on the water, marking the ends of each trawl. The fishermen spend the day going along the trawls, pulling up the lines and taking off the fish. The trawl lines are then hauled back into the boat, coiled in their tubs, re-baited and thrown out again. Each boat has several tubs of lines, so the fishermen tend several thousand hooks all day long. In the evening, although the men are hungry and tired, they have to clean the fish and store them in the hold before their day's work is done.

Our dragger, along with the other larger ships, goes far out to sea to fish on one of the banks. Instead of trawl lines used by the smaller boats, our dragger uses a bag-shaped net, which it drags along the ocean bottom. This net gathers fish of many kinds and sizes. The holes in the net are large enough so that the smaller fish can escape.

It is very important that the small fish escape. You may think that there are so many fish that there will always be enough. This is not so. Fishermen in the past have caught so many that the world's supply has been greatly reduced. If care is not taken, there is a serious danger that there will be fewer and fewer fish to catch. This will make it harder for our fishermen to earn a living and will make sea food more expensive.

It is an exciting minute when the net is hauled to the side of the boat, filled with fish. As soon as it is emptied into the dragger, it is again lowered into the sea. The fish are cleaned, washed, and packed in ice to preserve them until the ship reaches port. Before we left port our captain took on enough ice to last until we return and unload our catch.

Do not imagine that deep-sea fishing is easy or pleasant work. The ocean is seldom smooth, and rarely as calm as a lake or a pond. Sometimes great waves lift the boats up and then let them down into the *troughs*, or deep hollows between the waves. In winter

it is cold and often it rains. Sometimes a thick fog settles down. The Gulf Stream is a warm current of water that sweeps from the Gulf of Mexico northeastwards off the Atlantic coast. South of Newfoundland it passes the cold Labrador Current. The winds blowing over the warm water from the south absorb, or take up, moisture. When the warm wet winds blow over the cold waters from the north, the moisture forms in very small drops which are seen as a cloud of fog. When a thick blanket of fog lies over the ocean, it is impossible to see in any direction, and fishing vessels have been sunk when large steamers ran into them.

In spite of all this, our captain tells us that fishing is easier than it used to be. Deep-sea fishing was not always done by draggers. Sailing vessels, called *schooners*, with small row boats, or *dories*, were once used almost entirely. They used trawl lines like those of the modern small power boats. Fishing from dories was slower and much more dangerous than fishing from draggers is today.

Hauling in a netful of fish on a Grand Banks trawler.

National Film Board Photograph



Unloading herring at Kelly's Cove, in Nova Scotia.

Department of Fisheries



*Lobster fishing in
New Brunswick waters.*

*The lobsters are
being crated ready
for shipment.*



Courtesy of Canadian National Railways

As soon as the draggers have a full load, or have been at sea about seven days, they return to their home port. There the fish that have been kept on ice are unloaded at a processing plant. Here some are prepared for shipping fresh. Others are quick frozen, and shipped at once in refrigerator cars to Montreal, Toronto, or other cities of eastern Canada or of the United States. Still others are salted and dried. Since dried fish keeps very well, even in a hot climate, much is shipped from the Atlantic Provinces to such warm regions as the West Indies, northern South America, and southern Europe.

Inshore fishing • Inshore fishing is carried on not far from the shore. Small boats put out in the morning and return with their catch towards evening.

The catching of lobsters is an important inshore fishing industry in the Atlantic Provinces. Lobsters are queer, ugly, dark-green creatures having a hard shell and strong claws. They are not caught on hooks or in nets, but in wooden traps. These traps have two small openings, and bait (usually a piece of herring) is placed inside to coax the lobster in. Once in the trap, the lobster cannot get out. Most lobsters are shipped alive, on ice, to cities of the eastern United States,

but some are canned or fresh frozen and sold locally or exported.

Sealing • Sealing used to be an exciting adventure in the early spring. Some sealing is still carried on, but it is much less important now than it once was. The seal fat is used to make a fine quality of oil and soap, while the skins are made into a fine grade of leather used for purses and handbags.

Fish processing • At Halifax, North Sydney, St. John's, Port aux Basques, and many other places around the shores of the Atlantic

Selling oysters in Prince Edward Island. The oyster protects its soft body with a thick, rocky-looking shell.

National Film Board Photograph



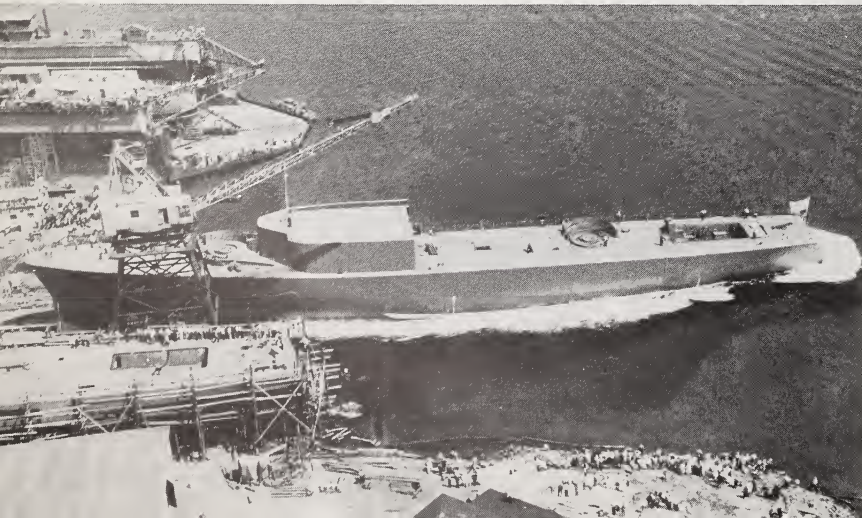


Courtesy of Canadian National Railways

Packing fresh fish to be frozen for export.

Provinces, there are fish-processing plants. Fish processing is the industry in which products of many kinds are made from fish. In some of these plants fish are quick frozen as fillets, prepared as fish sticks, or canned. In others the waste from the fish (such as heads, bones, and tails) is ground up to make fish meal, which is used for fertilizer, or plant food, and for feed for cattle and chickens. Some of the fish meal is used in Canada and some is shipped to foreign countries. Many of the smaller herrings are canned as sardines.

Royal Canadian Navy Photograph



*Launching a new
destroyer escort
for the Canadian navy
at the shipyards
in Halifax.*

One of the largest sardine factories in the world is at Black's Harbour, New Brunswick, on the north shore of Passamaquoddy Bay.

Another product of the sea • Along parts of the Atlantic coast, especially in Nova Scotia, a seaweed known as Irish moss is harvested. It is gathered in shallow water near the shore with long-handled rakes and put to dry. The choice parts are sold for use in making chocolate milk, ice cream, and cream cheese.

Other industries depending on fishing • You have been learning of the ways in which the fishing industry provides work for many people. You can perhaps think of some other kinds of work that depend on fishing. For example, ice must be provided so that fresh fish can be shipped to distant markets. Ice plants in some of the larger fishing centres make artificial ice for this purpose.

Then there is the making and mending of fish nets, and the making of fishing lines, hooks, bait, ropes, anchors, engines for use in different kinds of boats, and the many other things that fishermen need. Nylon lines for trawling and nylon twine for the heads of lobster traps are saving fishermen both time and money. Nylon is unharmed by salt water and nylon lines rarely break. Still more important is the building of fishing boats of many shapes and sizes. In the days when all ships were built of wood, Nova Scotia held a

proud place in the shipbuilding trade. Now steel ships are built at Halifax, Dartmouth, Saint John (New Brunswick), and other Atlantic ports. Wooden boats of all kinds are still built, however — sturdy boats that fishermen use in many waters, as well as row-boats and motor boats.

In the harbours of Halifax, Saint John, and St. John's, there are dry docks so large that even ocean ships can be docked for repairs. This is important because, just as cars break down and require garages where they can be repaired, things sometimes go wrong with ocean vessels. These dry docks may therefore be thought of as garages where vessels can be looked after and repaired. A dry dock brings much wealth to the port to which it belongs. If a ship is tossed around by a North Atlantic gale and loses its rudder, a wireless message can be sent to the nearest port which has a dry dock. Immediately a tug sets out from that port, puts a line aboard the ship, and tows it into port for repairs.

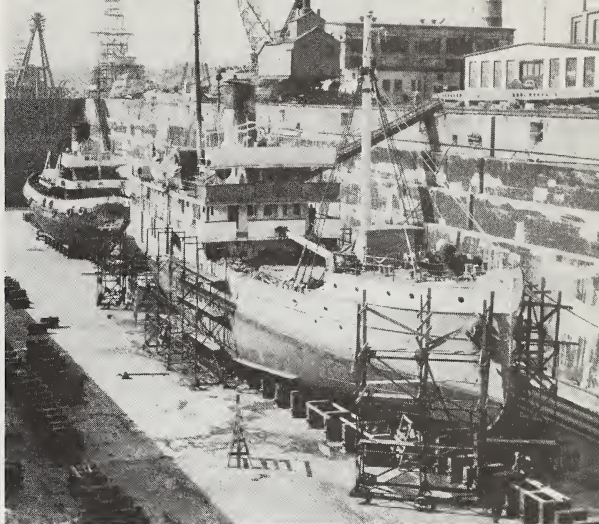
SOME THINGS TO DO • 1. On the map on page 116, find railway lines over which might be shipped (a) fresh haddock from Halifax to Toronto; (b) fresh lobster from Prince Edward Island to Montreal; (c) trawl lines from St. John's to Port aux Basques.

2. Read about the fishermen of the Grand Banks in *Captains Courageous*, by Rudyard Kipling. Then write an account of the life of a deep-sea fisherman.

3. The next time you go to the grocery store, see if your grocer has any fresh, canned, frozen, or smoked fish that came from the Atlantic Provinces. If so, try to learn what place the fish came from, and find that place on your map.

4. Find pictures of sailing boats — either fishing boats or pleasure boats. Study carefully the shape of the sails and the way by which they are held to the masts. Learn the names of as many parts of a sailing boat as you can.

5. Ask your teacher to help you to find out about the life and habits of (a) a codfish; (b) a lobster; (c) an Atlantic seal.



Courtesy of Canadian National Railways

Ships being repaired in the dry dock at Saint John, N.B.

6. Plan an exhibit for a trade fair to advertise the fisheries of the Atlantic Provinces.

7. If you are lucky enough to be acquainted with a banks fisherman, ask him to tell you a yarn about deep-sea fishing. If not, perhaps you can find a book of such yarns in your school or town library. Re-tell one of the yarns in class.

8. In an encyclopedia or other reference book, find out how sardines are cooked and canned. Then write a story about an imaginary visit to a sardine factory.

9. Make a list of as many industries as you can that depend on fishing. Can you think of any that are not mentioned in this book?

FARMING IN THE ATLANTIC PROVINCES

In the early days • The first attempt at farming in these provinces was made by Champlain's little band. You have learned how, after their first hard winter at Ile St. Croix, they crossed the Bay of Fundy, and at Port Royal, on Annapolis Basin, they made a second settlement. There they found fertile soils for producing crops.

When the tides from the open ocean enter the narrowing Bay of Fundy, the water rises higher and higher. Near the eastern end of the bay the tide sometimes rises over forty

feet, flooding the low shores. When the tide ebbs, plains of reddish mud are left uncovered. To these tidal plains the French government sent out colonists who knew how to build dikes. When the dikes were built, the colonists drained the rich land, and soon were able to raise large crops of hay and vegetables. Even today there is much diked land in Nova Scotia and New Brunswick along the shores of the Bay of Fundy.

When the English took over Acadia they found well-cared-for farms along the Bay of Fundy coast of Nova Scotia, especially around Annapolis and Minas basins. In 1755 the English turned many of the Acadian farmers out of their homes, and the diked lands were deserted for a time. The English settlers spread from Nova Scotia to Prince Edward Island and New Brunswick. Scottish settlers came, too, and settled in Nova Scotia, chiefly on Cape Breton Island. Germans also formed several settlements, especially around Lunenburg. The ancestors of Captain Zinck, of *The Fisherman's Hope*, were Germans. In time, many Acadians came back to their old land, if not to their old homes, and within recent years, French Canadians from the Province of Quebec have been moving into northern New Brunswick. Both British and French settlers came to Newfoundland, the British to the east coast and the French to the south and west coasts.

Present-day farming · What parts of the Atlantic Provinces have been found to be best for farming? Farming is carried on all over Prince Edward Island. In fact, this island is sometimes called "The Garden of the Gulf," for, with its good climate and fertile land, most of it can be made to produce good crops. In Nova Scotia most of the southern part of Cape Breton Island is also given over to farming, as is the area around the Bay of Fundy and south of Northumberland Strait. In New Brunswick the valley of the St. John River is a famous farming district. In New-

foundland the chief farming districts are the Avalon Peninsula in the southeast and the southwestern part of the island. In the southwestern part there is less fog and more sunshine than in the east, and the summers are warmer.

Why different crops grow in different regions ·

Why does farming in one part of Canada mean great fields of wheat as far as the eye can see, and in another part a very small farm where fruit and vegetables are grown? In order to find out why certain crops are grown, we should know what helps a farmer to decide how he can put his land to the best use.

The first thing to be considered is the yearly amount of rainfall, which means both rain and water from melting snow. Some crops, such as hay, need a great deal of rain, while others, like wheat, will not ripen where the ground is wet for much of the time. Important, too, is the time of year when the rain or snow falls.

The length of the growing season is important. This is the part of the year between the last killing frost in the spring and the first killing frost in the autumn. Some crops, such as cotton or corn, need a long growing season and very warm weather in order to grow and ripen. Other crops, such as potatoes and oats, can be raised where the growing season is short and where the weather is cool, even in summer.

The amount of sunshine, too, is important. Where fogs come often some crops cannot ripen. The soil is also important. Crops cannot be grown on thin, poor soil.

Another thing that a farmer has to consider is the distance between his farm and a market, or place where he may sell his crops. If he is very far from a market, he must raise crops that do not spoil quickly, so that they can be transported, or carried, without damage. If his farm is near a city, so that only a short trip is necessary, he can supply the



Nova Scotia Bureau of Information

Apple blossom time in the Gaspereau Valley, Nova Scotia. Are apples the only crop being raised?

market there with fresh vegetables, fruits, milk, and eggs. The use of cold storage is helping to overcome this problem. A farmer who lives near a railway can ship produce long distances in refrigerated cars and have it reach the market in good condition.

All these things, such as amount of rainfall, length of growing season, hours of sunshine, soil, and distance from market, help to decide the types of farming you will find in different parts of the country. The most common farm of all is the kind on which some grain, hay, root crops such as potatoes and turnips, and garden vegetables are raised, and a few cows, pigs, chickens, and a horse or two are kept. This type of farming, which brings the farmer money from several different kinds of farm products, is called *mixed farming*.

SOME QUESTIONS TO ANSWER • Using the map on page 15, and what you have read, answer these questions.

1. Which part of Newfoundland has the greatest annual rainfall? (*Annual* means yearly.)

2. Which parts of the Atlantic Provinces have the least annual rainfall?

3. If you live in another part of Canada, how does the amount of annual rainfall near your home compare with that in the Atlantic Provinces?

4. Mists and fogs from the Atlantic sweep in over the east coast of Newfoundland. How does this affect the yearly amount of sunlight?

5. You have already read that the east coast of Newfoundland has poor, thin soil. Where then will you find the best farmland?

6. Wheat needs less than 20 inches of rain a year, and will not ripen if it is too wet. Oats need plenty of rain. Which would you expect to find in the Atlantic Provinces, oats or wheat?

Crops of the Atlantic Provinces • You have already read that much of the eastern part of the Atlantic Provinces has poor, thin soil. This means that, except in the diked marshland regions around the Bay of Fundy, there are no large areas of level, fertile land, and therefore few large farms. Mixed farming is common. There is plenty of rain during the summer; but since the spring is late and cold, the growing season is short. Because this is so, hay, oats, and potatoes are the best crops for the Atlantic Provinces. More land is used for



New Brunswick Government Information Bureau Photo



International Harvester Photo

A variety of farming scenes: cutting grain in the St. John Valley of New Brunswick; a dairy farm in Prince Edward Island; seeding potatoes on a farm in New Brunswick.

these three crops than for all the other crops put together. Wherever you go in summer, you will see these crops growing on the farmlands. Since they make good food for cattle, you will find that nearly every farm has dairy cattle. In fact, in Nova Scotia, New Brunswick, and Prince Edward Island, dairy farming is one of the leading branches of farming. In Newfoundland, however, it is not important.

The potatoes of Prince Edward Island and certain parts of New Brunswick are shipped to many parts of eastern Canada. Potatoes for seed, raised in these provinces, are sold in Canada and are shipped from Saint John and Halifax to foreign countries. Seed potatoes must be grown very carefully, and only the very best can be used. This means, of course, that the farmer asks a higher price for these potatoes in order to pay him for the extra work that is necessary. Oats are also raised for seed in some parts of the Atlantic Provinces.

Fruits of several kinds are grown in the Atlantic Provinces. Hundreds of children, as well as grown-ups, are kept busy picking the raspberries, currants, gooseberries, strawberries, and blueberries which ripen in the summer sunshine. More strawberries and blueberries are being grown all the time, especially in the western part of Nova Scotia, and many of these are shipped to the eastern part of the United States. Many of the bogs of Nova Scotia produce fine cranberries. Blueberries grow well in Newfoundland too, and are shipped frozen to the United States. Since Nova Scotia is much nearer to the market, however, it is more difficult to sell the Newfoundland berries at a profit.

The apple is the best known fruit in the Atlantic Provinces. Except in Newfoundland, apple trees are found on almost every farm, and the Annapolis Valley is one of the finest apple regions of Canada. It is protected from strong winds by North Mountain

and South Mountain. Moisture from the Bay of Fundy causes a milder climate with less danger from frost.

In the spring, people come long distances to see the Annapolis Valley with its fifty miles of apple blossoms. In the autumn the valley is a busy place. Pickers gather the fruit carefully. The apples are then sorted, packed, and sent to Halifax for export. Some years it is not easy for farmers to sell their apples. In recent years many of the old trees have been cut down. Young trees, which will bear the more popular red apples, have been planted. Other fruits, such as plums, pears, strawberries, and raspberries, are being grown. Hay, oats, potatoes, and vegetables are also grown in the Annapolis Valley. In this way a farmer has other crops to sell when his apple crop is poor or not wanted.

Before we leave the farmlands of the Atlantic Provinces, let us visit a classroom in the Annapolis Valley and hear what two children have to say about farms and crops in their part of Canada.

One September morning the air was sweet with the smell of crushed apples coming from the canning plant near the railway, not far from the school. Miss Robinson, the teacher, asked John Travers to tell about life on a farm.

"We live about four miles from Kentville," began John. "Father says that our land is almost perfect for an apple orchard, as it slopes gently to the Cornwallis River. To the northwest we can see North Mountain about five miles away. Beyond it is the Bay of Fundy.

"We have about twenty acres planted with apple trees. This part of the farm is on the higher ground, above the valley where the cows graze. We also have a field of oats and a vegetable garden. We grow enough potatoes, carrots, beets, and other vegetables to last us the year round. At each season of the year there is something to be done on the farm. The trees need to be sprayed and cut back. Seeding and planting have to be done in the spring, weeding during the growing season, and harvesting in the fall. Of course, the cows have to be cared for all the year round."

Miss Robinson asked the class whether anyone wanted to speak about other kinds of farming.

"I do," said Mary. "I have an uncle who farms near Perth in New Brunswick, not far from the Maine border. That part of Canada and the part of the United States nearby are famous for growing potatoes. My uncle has only a few apple trees on his farm, but he grows more than fifteen acres of potatoes.

Farm lands in the Avalon Peninsula, near St. John's.

Philip Gendreau, N. Y.



"He also keeps cows," added Mary, "and grows oats and hay to feed them. He has a vegetable garden, and vegetables not needed by the family are sold in the nearby towns. So you see, my uncle grows most of the food that the family needs, and at the same time earns money from his large potato crop."

MAP EXERCISES • 1. On a blank map print in the names of the four Atlantic Provinces, the Bay of Fundy, Annapolis Basin, Minas Basin, Cabot Strait, and Northumberland Strait. Trace the St. John River and print in its name. With a green crayon draw a line around those parts of the provinces where farming is an important industry. Keep this map to complete later.

2. Turn to the map on page 188 and find the regions marked "Mixed Farming." You can see that this is the most common type of farming in the Atlantic Provinces. Turn back to page 31 to make sure you understand what mixed farming is. Find also the regions marked "Dairying."

On the map of the Atlantic Provinces that you have made, mark with different colours the areas where these kinds of farming are carried on. Ask your teacher to show you how to make a key at the bottom of your map which will tell what you mean by your colours.

SOMETHING TO DO • Pretend that you have been sent from Britain to buy food from the Atlantic Provinces. Plan your trip, listing the regions you would visit, the crops you would find, the food

products that might be bought for export, and the port from which each might be shipped to Britain. The maps on pages 188 and 22-23 will help you.

FUR FARMING

The growth of fur farming • In a country such as Canada, where winters are cold, the skins of many fur-bearing animals are needed for making clothing. When Canada was first settled, furs could easily be obtained by trapping wild animals. Today so many of the wild animals have been killed off that it is difficult to trap enough for the fur market. To keep certain fur-bearing animals from disappearing altogether, many fur farms have been started. These farms provide more than one fourth of all the furs now produced in Canada.

Fur farming was first started in the Atlantic Provinces and it is still carried on in several parts of this region. The Atlantic Provinces have an advantage over other parts of Canada in fur farming, since the fishing industry provides a ready supply of food for the animals.

You may be interested in the story of how fur farming began. Back in 1894 a couple of Scotsmen on Prince Edward Island caught a few silver black foxes in order to raise more animals and "harvest" their pelts, or skins, which were very valuable. To keep their new business a secret they had their fur farm on an island, so that when they went there, they could pretend to be taking care of the lobster traps they had put around the island. However, one winter when Northumberland Strait froze, a fox escaped over the ice to the mainland. Hounds trailed it back to its den, and so the secret of fox farming was discovered. The great industry then began in earnest, and since that time it has spread to many parts of Canada. In some places fur farming is an important industry which gives work to many people. In others, farmers who find it difficult to make a living by farming

A fox on a Prince Edward Island fur farm. The animal became excited by the presence of the photographer and climbed up the side of its pen.





Courtesy of Canadian National Railways

A pulp and paper mill at Dalhousie, New Brunswick. Pulpwood is piled high at the right.

in the usual way, keep a few foxes or mink to earn a little more money. Several kinds of animals are raised on fur farms, but mink and foxes are those that are most commonly raised for their fur.

FOREST WEALTH

Timber and pulpwood are two important products of Atlantic Provinces forests. Timber usually means trees that can be sawn up to make boards, furniture, and other things made of wood; pulpwood is usually softwood that may be made into paper.

Prince Edward Island lacks timber. This does not mean that there are no trees there to cut, but that there are no real forests. Why do you think that this is so? New Brunswick and Newfoundland have the most timber. Many of the forests of Nova Scotia are near the southern coast. Why has this land not been cleared for farming?

Kinds of trees • Many of the trees in the forests of the Atlantic Provinces are soft-

wood; these are what are known as *conifers*, or cone-bearing trees. Conifers are evergreens, which do not drop their needle-shaped leaves in the autumn. In the Atlantic Provinces, spruces, balsam fir, pines, and hemlock are the principal coniferous trees. The red spruce is the most important of all. The larger conifers may be manufactured into lumber, while the smaller trees are used for pulpwood.

Other trees found in the Atlantic Provinces are birch, maple, oak, and beech. These are the hardwoods. They have broad leaves which they shed in the autumn.

Lumbering • Lumbering is an important industry in New Brunswick, Nova Scotia, and Newfoundland. The forests of Nova Scotia have been cut over for a long time, but in the northern half of New Brunswick, and in the valleys of central Newfoundland, many of the forests are very thick. Each summer the lumbermen build many miles of rough truck roads deep into these forests. In

early autumn the *lumberjacks* move in to build camps and dams, and begin cutting the saw logs or pulpwood. From November until the end of January, the men are busy cutting down trees, chopping off their branches, and cutting up the trunks into lengths that can be moved. Pulp logs are shorter than saw logs, and are all cut to the same length. Sometimes the logs are loaded onto trucks and hauled to the mill. Sometimes they are piled on the banks of a stream to wait for the spring thaw, when they are floated downstream to the mills.

A lumberjack's story • Here is the story told by a lumberjack who works in northern New Brunswick.

"My name is Joe LeBlanc. Ever since I was a boy I have wanted to work in the woods. Now, here I am, and I would not change for any other life. We work hard, yes, but we are out in the sunshine and fresh air. At night we have a good bed, and a warm camp with electric lights, hot and cold water, and plenty of room. As for food, it is of the best, and we can have all we want. What more can one ask?

"The camps are built during the summer. At the same time other crews of men 'bulldoze' narrow roads through the part of the forest that is to be cut over. Along these roads the timber will be hauled to the stream

where it will be piled ready for the spring *drive*. Still other crews clean out the streams and build dams upstream from where we will pile our logs.

"At last in early autumn the day comes when the cutters can begin. Two men cut down the trees, chop off the branches, and saw the trunks into log lengths. A third man fastens a chain around each log so that a horse may drag it to the nearest road. Here the logs are stamped with the company's mark and arranged in piles or 'yards.'

"The government scaler then *scales*, or measures, these logs. The lumber company must pay a set amount of money, known as 'stumpage,' if it is cutting on lands owned by the province.

"As we work, we try to take care of the forest. The government tells us we must cut only a certain number of the larger trees. The younger trees are left to grow. Who knows, in a few years we may be back in the same place. Then these young trees will be fine, big trees, large enough for us to cut.

"As soon as there is enough snow, and the ice on the river is strong enough, the business of hauling the logs to the river begins. In the old days horses were used for this work, but now a caterpillar-tractor draws a whole train of sleds loaded with logs. Out on the ice the log train goes, unless the bank is too steep. In that case horses have to take the loads down one by one. On the ice the logs are unloaded and piled neatly, all headed downstream.

"Day after day our work is much the same. We get up very early, dress, and wash in the washrooms at one end of the bunkhouse. You would be surprised to see how much breakfast we eat, but you must remember that we have to work hard all day long in the frosty air. At noon we usually have a cold lunch, which we carry with us. However, if we are not far from camp, a warm lunch of thick soup or baked beans

Clearing ground with a bulldozer for a road through the forest.

New Brunswick Government Information Bureau Photo





Publicity Services Ltd., Montreal

Aircraft spraying New Brunswick forests to protect them from insect pests. Inset, the spruce budworm that is costing the country millions of dollars in forest loss.

may be brought to us. When it is too dark to work any longer, we go back to camp for dinner. I can tell you that is a meal! We are very hungry, and as we sit around the long tables, we do not talk much, we just eat. Usually we end the meal with pie, and always we can have a second piece, or even a third. We think our cook is the best in New Brunswick.

"After we have eaten all we want, we sit around on our bunks, or at the little tables by the roaring stoves. Some of us read magazines, and others play cards or checkers. Sometimes we sing. My friend, Gerard, has a fiddle, and three of the others have mouth organs; the rest of us sing or whistle, and keep time with our hands and feet. Soon we begin to be sleepy, and, one by one, we turn in for the night.

"The spring drive is the most exciting time of the year. The snow begins to melt, the roads through the woods become muddy,

and at last the river ice breaks up and the logs begin to float downstream. All the dams on the tributaries have been closed; but even so, the water in the river is high and the logs race along. We must follow them to keep them moving and to see that they do not jam. Sometimes, in spite of all our care, a jam forms, and hundreds of logs pile up on top of one another, blocking the river so that it may overflow its banks upstream at that point. Then the most skilful men on the river go out onto the jam and try to find and pull out the log that is causing the trouble. If this is not enough, they set off a blast of dynamite beneath the jam. This loosens the logs and lets them continue their journey downstream. If the men who go out to break the jam are not quick and clever on their feet, they can be rolled over and killed as the logs come loose.

"When the first 'run' is over, some of the men go back upstream and collect any of



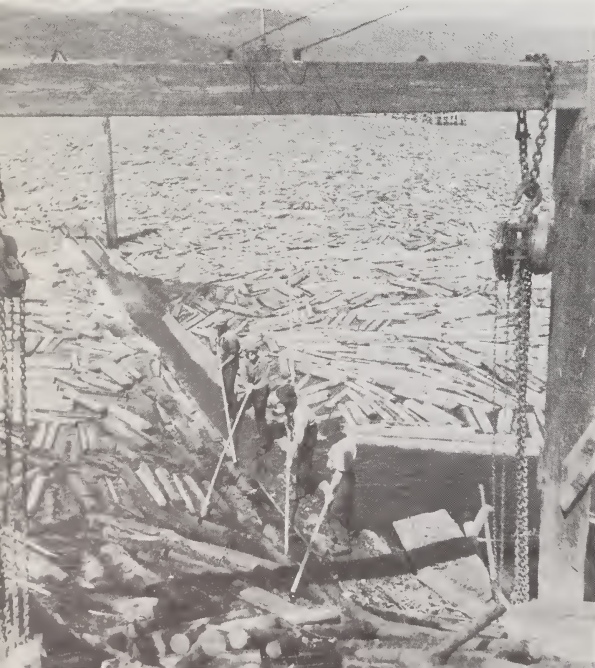
New Brunswick Department of Lands and Mines

Pulpwood held in the "boom" at the mouth of the Restigouche River.

the logs left behind. They drag or roll these to the river's edge with their peavey poles, which are poles with a sharp spike at the end and a strong hook just before the spike. When all the logs are collected, the

Lumbermen with peavey poles guiding logs onto the jack ladder which carries them to the mill at Newcastle, N.B.

Courtesy of Canadian National Railways



closed dams on the tributaries are opened, letting out the water behind them. This rushes into the main river, carrying the rest of the logs with it.

"When the logs reach the mill, they are put in the *boom* of the company's mill pond. A boom is made of long logs chained together, end to end, and fastened to trees or other strong supports on shore. Within this boom the logs float safely and cannot drift away. Once all the logs are in the boom, we receive our pay and go home to our families, whom we have not seen for months. We are glad to be home, as you may imagine; but when the cold weather comes again in the fall, most of us think only of returning to the woods."

Sawmills and pulp-and-paper mills • The logs which go to a sawmill from the forest are gathered into a quiet pond to be stored until they are needed. Day after day they pass into the mill in a never-ending procession. From inside the mill comes the screech of the great saws as the logs are cut up into boards. And from the other end of the mill come piles of boards still smelling of the forest — the fresh, clean smell that every woodsman loves. The boards and planks are then shipped away to lumber yards in towns and cities, to be used in making many things, from great buildings to small packing cases.

Pulpmills are usually larger than sawmills, since they require much expensive machinery. Newfoundland, New Brunswick, and Nova Scotia have pulp-and-paper mills. Although most of these mills are not so large as those of Quebec and Ontario, they have the advantage of being nearer to the eastern United States and Europe. From mills on the coast the paper can be loaded directly onto ships.

Newfoundlanders now make more money from the pulp-and-paper industry than they do from fishing. The two principal mill towns in Newfoundland are Grand Falls

and Corner Brook. The paper mill at Corner Brook is said to be the largest in the world. It has a better position than Grand Falls, since it is located on the coast and its paper can be loaded from the company wharves directly onto waiting steamers. But let us pay a visit to Corner Brook and so catch a glimpse of Newfoundland.

A visit to Corner Brook • We take the night steamer from Sydney. Although it is June, the night air over Cabot Strait is cold, and we are glad of the warm blankets. In the morning, we see the rocky cliffs of the Newfoundland coast. To our alarm, we notice that our ship is heading right for these cliffs. Is the captain watching what he is doing, we wonder? Then we see a narrow opening in the rocky wall. Our ship sails through this, and to our surprise we see ahead of us a sheltered bay, with the houses of Port aux Basques set around it on ledges of the rocky hill slope. Port aux Basques got its name from the Basques, a people of southern Europe who fished here four hundred years ago.

Soon we are on the train and heading north. At first we see no trees, only bare rocks, moss, and marshland — with dry areas here and there where low bushes grow. Sometimes the railway runs close to the shore. Sometimes it turns towards the mountains to the east, where patches of snow are still to be seen.

After about an hour, we cross the beautiful Codroy Valley, where there are green fields, cozy farm houses, and forested hill slopes. Two rivers flow gently to the sea. "Salmon up those rivers," the conductor tells us, "big ones too! People from the mainland and the United States come here to fish. Every year there are more."

As the train puffs up steep slopes and around sharp curves, we see small farms, where a few sheep are nibbling the tender grass. In other forest clearings lumbermen are at work.

Late in the afternoon we reach Corner Brook, built at the head of Humber Arm. The paper mill, the mill-yards with their great piles of pulpwood, and a few public

Paper mill at Corner Brook. Notice that ships can load and unload at the company's wharves.

Courtesy of Canadian National Railways



buildings, are on the only level land. Even this was made by filling in a part of the bay. The rest of the city, including a hospital and several churches, is built on the surrounding hillsides. From the top of the hill there is a beautiful view of Humber Arm and Blow-Me-Down Mountain.

The paper mills give work to most of the people of Corner Brook. The pulpwood is floated down the Humber River, towed by tugboat up Humber Arm, or brought by railroad from farther inland. During the summer the paper is shipped out by steamer from the company's wharf. In the winter it goes by train to Port aux Basques, where the harbour is free of ice. Most of it is shipped to the United States.

Fishing is another important industry in Corner Brook. Salt-water fish, chiefly herring, are caught in Humber Arm. Salmon and trout bring sportsmen to the Humber River. In the valley of the Humber is some of the most beautiful scenery on the island.

Christmas trees • Did you ever stop to wonder where your Christmas tree came from? Perhaps you helped to get yours from the woodlot on your father's farm. Many people, especially those in cities, cannot do this. In the warmer parts of the United States, balsams, which are very popular as Christmas trees, do not grow.

In New Brunswick and Nova Scotia many such trees are cut, tied in bundles, and hauled to the railway. Then they are shipped away, most of them to the eastern United States. Some go as far as Florida.

Care must always be taken not to cut or damage the smaller trees. These must be left to grow, to bring pleasure to the boys and girls of tomorrow.

SOMETHING TO DO • Find the rivers down which pulpwood floats to the mills at Bathurst, Dalhousie, Newcastle, Liverpool, and Corner Brook. Which is the longest of these rivers? Which flow into Chaleur Bay?

MINING IN THE ATLANTIC PROVINCES

Minerals are treasures that Nature has stored in the earth. Sometimes they are found on or near the surface of the ground, but usually they are hidden deep down in the rocks. Look up the word "mineral" in your dictionary to make sure you understand what it means. Make a list of all minerals you have heard of and compare your list with the lists made by other members of your class.

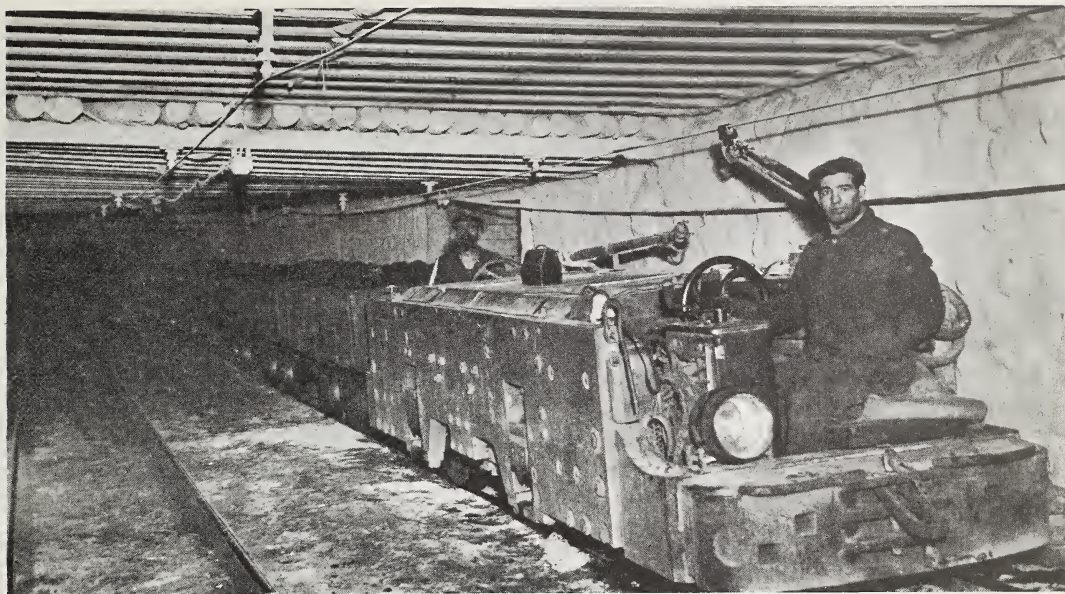
Coal mining • The most important mineral in Nova Scotia is coal. Many men are kept busy mining coal found there, especially at Glace Bay, at Sydney Mines, at Springhill, and in the region around New Glasgow. Some coal is also mined in New Brunswick.

To mine coal, deep shafts, or tunnels, are sunk far down into the earth, and from these the miners dig levels, or side tunnels, which reach out in all directions, sometimes even under the sea. Coal, as you know, provides fuel for factories, homes, ships, and railways. It is also one of the raw materials used in the manufacture of dyes, nylon, and some medicines. Since Quebec has no coal, Nova Scotia is able partly to supply its needs, in addition to those of Prince Edward Island and Newfoundland. New Brunswick mines much of the coal it needs.

Let us visit a Nova Scotia coal mine and see for ourselves how the coal is obtained. Mr. Bell, the mine manager, is going to be our guide.

"I'm glad you have on your old clothes," says Mr. Bell. "Coal mines are dirty and dusty places. Let us go to the lamp house and get an electric lamp for each of you. The main passages in the mine are lighted, but we'll need miners' lamps on our caps in order to see in the side roads."

Having got the lamps, Mr. Bell leads us towards the shaft, past a big building. The door to this building is open, and as we look



Dominion Steel and Coal Corporation, Ltd.

A train in the main "haulage way" of the mine. This "haulage way" is three and a half miles long.

in we see an engine driving a huge drum round which is coiled a wire rope. From this drum the rope runs upwards and out through a hole in the side of the building.

"This is the winding engine," Mr. Bell explains. "The rope that you see runs over a big wheel above the shaft and is attached to the *cage* which runs down to the workings where the coal is. The man who runs this engine has a very important job. He must see that he stops the engine when the cage is exactly at the top or bottom of the shaft. He cannot see the cage, but he has a pointer on a dial in front of him which shows just where the cage is."

As we walk towards the shaft, we have to cross lines of railway tracks. On these are freight cars; some are full of coal and others are empty. The empty cars will be run onto tracks which pass under a building called a *screen house*. The coal is brought up out of the mine in small cars, which are lifted by a machine called a *hoist* to a platform above the screen. From the cars the coal is dumped

into the screen, where it is weighed, sorted, and then allowed to fall into the coal cars waiting on the tracks below.

At the top of the shaft we wait for a minute or two until the cage comes to the surface. The two loaded cars are drawn off, and we step on. Tom remarks that it is just like stepping onto an elevator in a department store.

The gate closes, a bell rings, and we are off! Down, down, down into the earth we travel, far faster than any department-store elevator. In the dim light of our lamps the walls of rock seem to be rushing upwards. Now and then we hear the trickling of water, and a drop or two splashes into our faces. We can see water shining on the walls of the shaft.

"What happens to all this water?" asks Jim.

"It runs down to the bottom of the shaft, and then we pump it up to the surface to keep the workings from being flooded. Some mines are 'dry,' but here we have to go to a



Dominion Steel and Coal Corporation, Ltd.

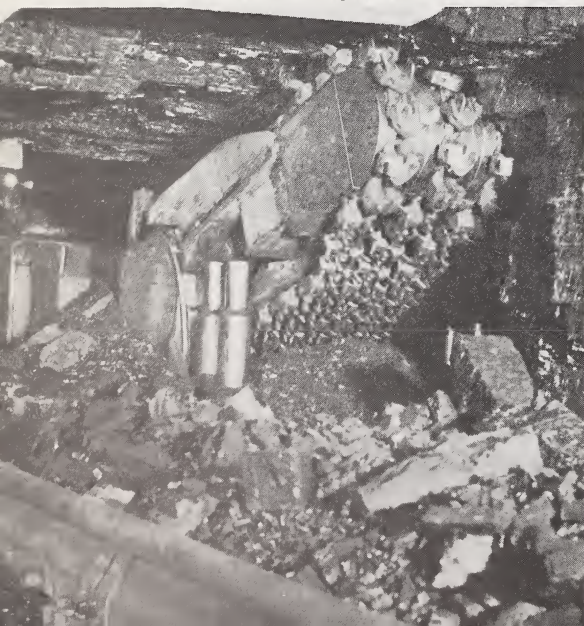
*Testing for explosive gas with a safety lamp.
Notice the props supporting the roof.*

lot of trouble and expense to get rid of the water."

Suddenly our speed slows down, we go more and more slowly, and then, quite gently, come to a stop. The gate opens, and we step out into a tunnel lighted by electric lights. We had no idea it was like this a thousand feet below ground. Here, just as

A mechanical miner at work in a Nova Scotia coal mine. What are the advantages of using such a machine?

Dominion Steel and Coal Corporation, Ltd. Photo by Shedden



on the surface, there are railway tracks, only these tracks are narrower than the surface tracks. As we watch, trains of loaded cars appear out of some of the galleries which come in from all directions, and trains of empty cars disappear into other galleries.

"Where are the mechanical miners?" asks John. "I thought you used such machines to mine the coal."

"Not in this part of the mine," says Mr. Bell. "We use them at the workings. They cut out the coal and dump it into cars. From there the electric locomotives that you see draw the cars to the hoist."

We follow Mr. Bell down one of the tunnels, watching carefully to see that we do not trip over the tracks or bump our heads on the low roof. Every now and then we step aside into a niche, or hollowed-out space, in the tunnel wall as a train of cars rumbles by. These niches have been made for the safety of the miners.

After quite a long walk we come to the "working face," where a mechanical miner is at work. Coal is found in layers, or *seams*, something like the filling in a layer cake. The "cake" above and below the coal "filling" is rock. Here the seam is four and a half feet thick. To get the coal out, the mechanical miner tears out the coal from the solid seam and loads it onto a *conveyor*, or moving belt. The conveyor carries the coal along to the gallery and loads it into mine cars, such as we saw when we first entered the mine. These cars haul the coal to the shaft.

"In some mines," says Mr. Bell, "the seam is five or six feet thick. Here, where it is thinner, we have to blast out a good deal of rock so that our gallery will be high enough to move in men and cars as the coal is dug out. Often the walls and ceilings have to be braced with props and blocks to prevent them from falling in."

Back at the surface, in the screen house, we watch the coal being loaded on to railway

cars and hauled away to wherever it is needed. The mine which we have visited is near the sea, and so some of the coal is moved away by boat, as this is cheaper than by rail.

At Sydney, near the coal mines, there are large steel works. Steel is made from iron, and limestone and coal are used in making it. Little iron is found in Nova Scotia, but there are iron mines across the Gulf of St. Lawrence in the southeastern part of Newfoundland. The iron ore is shipped to the coal at Sydney. The limestone is brought from southwestern Newfoundland. Many articles are produced in the great steel works at Sydney. Among them are steel plate for ships, steel rails, nails, and barbed wire.

REASONS TO GIVE • Give at least three reasons why Sydney is a good location for steel works.

SOMETHING TO FIND OUT • See if you can find out about ways of making steel from iron ore (*see page 107*). List some of the uses of steel.

Other minerals • The iron mines of Newfoundland are on Bell Island, not far from St. John's. The iron ore is of good quality, and because it is mined near the water's

edge, it can easily be shipped away. Some goes to Sydney, and some to England and Germany.

Mining has become so important in Newfoundland that it has passed fishing as a source of wealth for the province. The most valuable mineral found in Newfoundland is zinc. It is mined at Buchans near Grand Falls. The zinc ore also contains lead and copper.

Ore containing zinc, lead, silver, and copper has been discovered near Bathurst, New Brunswick. In an encyclopedia look up the uses for these minerals.

Gypsum is used to make wall plaster, lath, and wallboard. More than three-quarters of all the gypsum produced in Canada comes from Nova Scotia. Study the map on page 141 to see where gypsum is found in the Atlantic Provinces. Find out how gypsum is obtained.

MANUFACTURING

The greater number of the people of the Atlantic Provinces make their living from the farms, the sea, the forests, and the mines. But year by year more people earn their

Tourist Bureau, New Brunswick

Open-pit mining in northern New Brunswick.

The ore contains lead, zinc, and copper.

Why is open-pit mining less expensive than coal mining in Nova Scotia, or iron mining in Newfoundland?



living by manufacturing, or making, things that they and these other people need.

When people manufacture, they use either the things round about them or those that they can get easily from other places. From these beginnings, or *raw materials*, they make either something they use themselves or something they can sell elsewhere.

In the Atlantic Provinces there are many raw products for manufacturing. Wood pulp, paper, several forms of lumber, and many articles made from wood are produced in mills and factories from forest products. In other factories fish and lobsters are prepared to be shipped fresh, frozen, or canned, and glue and fish meal are made. From the farms come many foods to be processed. Fruit is canned, apples are dried or made into juice or cider, oats are ground into meal, potatoes are made into starch, and milk is canned. Because farming is important, the repairing of farming machinery and tools has also become important. Other manufactures are stoves, railway cars, and cotton and woollen goods, usually spoken of as *textiles*. You have read that there are steel mills at Sydney. Where does the iron ore come from that is manufactured there?

Imperial Oil Limited



*A large oil refinery on
Halifax harbour.*



Dominion Steel and Coal Corporation, Ltd.

*Pouring white-hot iron into a furnace, where it
will be turned into steel, in a Sydney steel plant.*

Power is also needed to drive the machinery in manufacturing plants. All the Atlantic Provinces, except Prince Edward Island, have swift rivers on which electrical power can be produced. Electricity is also produced

in *steam plants* by burning coal. Steam plants are usually found near coal mines, or at ports, where coal is cheaper than it is inland. Gasoline engines are used in small plants. These, as you know, burn gasoline made from oil. Oil as it comes from the well is called *crude oil*. This crude oil is brought in by tankers to the refineries of the Atlantic Provinces. There it is made into gasoline, stove oil, fuel oil, and other oil products.

Much of the manufacturing in the Atlantic Provinces is carried on in small towns and villages, but it is in the cities that we shall find manufacturing at its busiest.

CITIES OF THE ATLANTIC PROVINCES

Halifax • In our visits to the cities of the Atlantic Provinces, our first trip will be to Halifax, which is the capital of Nova Scotia and the largest city in the Atlantic Provinces.

It is an old city and is built on and around a hill which looks out over its beautiful harbour to the sea. Halifax has Public Gardens with flowers and trees from many parts of the world. It also has interesting buildings: the Province House and Legislative Buildings, where the provincial government is carried on; four universities, one of which is the oldest in Canada; and a citadel, or fort, which was once a great protection.

The harbour at Halifax is so large, so deep, and so well protected from the storms of the ocean that it is used as a *naval base*, that is, a port where warships come in for shelter, supplies, and repairs. The port of Halifax is important not only to the Atlantic Provinces, but to the whole of eastern Canada. This is especially true in winter, when the St. Lawrence River is closed by ice.

If we visit the docks, we may see trains

A cruiser of the Royal Canadian Navy in Halifax harbour.

National Defence Photograph



unloading their freight directly onto waiting steamers; or we may see boxes of codfish and fish meal, piles of lumber, and products from many other parts of Canada on the docks, waiting to be shipped out. From the cold storage plant nearby have come butter, cheese, and meat; from the grain elevators has come wheat that has travelled all the way from the West. All these products being shipped out are called *exports*.

Imports are the goods which come in from other countries. Over here we see a ship from the West Indies from which bananas, oranges, and other fruit are being unloaded. Another ship, from Central America, has brought bales of *cabinet wood*. Cabinet wood is wood of fine grain, used in making furniture. This fine wood is stored in a warehouse until it can be shipped inland. Still another ship has brought spices, coffee, tea, cocoa, and other products from faraway hot lands. Some of these imports will be

manufactured in Halifax before being sent inland by train.

Across the harbour from Halifax, and linked to it by a bridge, is Dartmouth, where more manufacturing plants are found. There are aircraft plants, and oil refineries, using crude oil brought in chiefly from Colombia and Venezuela. Nearby is a large airport, used by Halifax and its district.

Sydney • Travelling north and east from Halifax, we reach Sydney, the second city in Nova Scotia, and an important steel producer. In most of the surrounding towns coal is mined. We find that the city is a railway and shipping centre, with a fine harbour. A large airport is nearby at Reserve.

Saint John • In New Brunswick we visit Saint John, at the mouth of the St. John River. It is the largest city of the province. Saint John is the chief port of New Brunswick, and, like Halifax, it serves as a port for all of eastern Canada during the winter.

Saint John, New Brunswick, showing the harbour and the railway lines which serve the docks.

Courtesy of Trans-Canada Air Lines





Courtesy of Canadian National Railways

The freight yards at Moncton. Find Moncton on your map. Why is it an important railway centre?

We see many manufacturing plants in Saint John. There are the lumber and pulp mills in which New Brunswick timber is prepared for shipment to England and the United States; plants which make the rope needed by fishermen and sailors; sugar refineries; candy factories; and places where the imported coffee and tea are processed.

There are many docks around the harbour, and a large dry dock where ships are repaired. Much the same kinds of work go on here as at Halifax. Here, too, are elevators in which grain from the West is stored before it is exported. We are shown a frost-proof warehouse, where fresh fruits and green vegetables that have been brought in from warm countries are safely stored during the cold weather. We also see raw sugar from the West Indies being unloaded to supply the sugar refineries, and molasses being pumped out of a small tanker.

Moncton • Moncton is the second largest city in New Brunswick. Let us look at the map for a reason for its importance. You will see that it is at the upper end of the

wide mouth of a small river and is near the Isthmus of Chignecto. This means that all the railways and main roads from New Brunswick to Nova Scotia pass through Moncton. Airlines, too, come to Moncton, and the Moncton airport has become an important one in the Atlantic Provinces. The city is also located in the centre of a fertile farming region. You can easily understand why Moncton is a busy city where there are stores and factories and railway yards, and where people come to do their shopping and marketing.

Fredericton • The capital of New Brunswick is Fredericton, on the St. John River. It is a beautiful city, with pleasant homes along streets that are shaded by tall elm trees. Fredericton is a centre of government and education, rather than an industrial city, although it has some thriving industries. The provincial university, famous for training forest scientists, is in Fredericton.

Charlottetown • Charlottetown, the capital of Prince Edward Island, is a quiet, pleasant city, as we should expect on a small island



Courtesy of Trans-Canada Air Lines

St. John's, Newfoundland. Notice how the land rises steeply from the water's edge.

where most of the people are farmers. It has a fine harbour and is the centre of the Island's trade. In the heart of the city is the House of Parliament, where the provincial government meets. In Charlottetown was held, in 1864, the first of the meetings which led at last to the uniting of four of the British colonies to form the Dominion of Canada.

St. John's • The oldest part of the city is built on a hillside overlooking a sheltered bay which gives it a magnificent harbour. Much of the manufacturing for the island used to be centred here, but some of the newer industries are now being built in other Newfoundland towns. St. John's still has many important manufacturing industries

however, including the canning and freezing of fish, and the making of cod-liver oil, fish nets, rope, paint, textiles, clothing, and hardware.

A GROWING INDUSTRY

In many parts of the United States and in parts of central Canada, people live closer together than do those who live in the Atlantic Provinces. This is especially true of the eastern part of the United States. Also, in most parts of the United States the summer weather is warmer than in the Atlantic Provinces. In the summer many of the people from the hot, crowded cities of the eastern States, Quebec, and Ontario, who want to get away where it is cool and

quiet, come to the Atlantic Provinces. These tourists come by train, by boat, by car, and by plane. Some of them have built cottages, camps, or summer homes; others stay in hotels, motels, cabins, or boarding-houses; some camp along the way. In New Brunswick, Newfoundland, and Nova Scotia there are fishing camps and hunting lodges. Swimming, fishing, sailing, boating, hunting — all these things the tourists enjoy. And the business of providing food, shelter, and amusement for the tourists gives work to many people in the Atlantic Provinces. As more tourists visit Canada, the tourist trade will become even more important.

THE NEWEST INDUSTRY

At Gagetown, in the southern part of the St. John River valley, a great camp and training ground for soldiers has been built. It is the only camp in Canada where soldiers can be given a complete training for war. Providing for the needs of so large a body of men is giving work to many of the people of New Brunswick. This work, unlike the tourist business, gives steady employment all year round.

LINKS BETWEEN THE NEW WORLD AND THE OLD

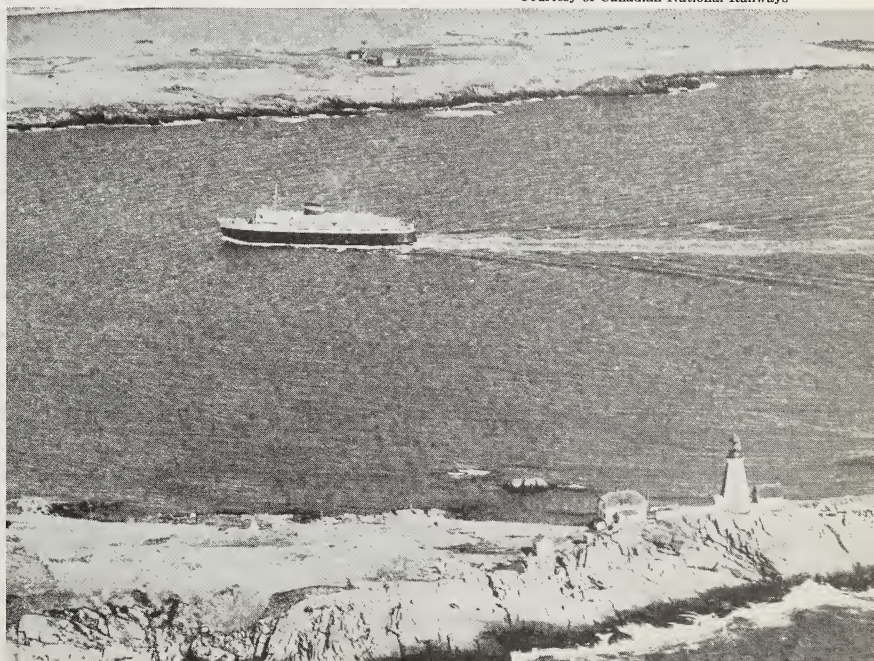
The Gateway to Canada • The Atlantic Provinces have always been important as a gateway. In the early days, in every war between the English and the French over the possession of Canada, fighting took place in one or more of these provinces. Since fighting ceased, the Atlantic Provinces have served as links, or “stepping stones,” between North America and Europe.

Sea links • The most travelled steamship routes in the world cross the North Atlantic. St. John's, Sydney, Halifax, and Saint John are the chief Atlantic ports of Canada. Ships which use the St. Lawrence Seaway must pass through either the Strait of Belle Isle or Cabot Strait.

Sea links also join the Atlantic Provinces with one another and with the United States. You have read of the ferry service between Sydney and Port aux Basques. There is also regular ferry service between Saint John and Digby and between Yarmouth and Bar Harbor in Maine. A *train ferry* crosses Northumberland Strait to connect Prince Edward Island with the mainland. A train ferry is a

Courtesy of Canadian National Railways

*Yarmouth lighthouse
and the ferry
“Bluenose” which sails
between Yarmouth
and Bar Harbor,
Maine.*





Ruggles Commercial Photographic Studio

Cabot Tower on Signal Hill, St. John's, Newfoundland, in which Marconi received the first wireless message sent across the ocean.

large ship which has railway tracks laid from one end of the deck to the other. When the ferry docks, the tracks on the ship are in line with the tracks on the shore, so that the loaded railway cars can roll onto the ship. This saves the delay and expense of unloading and reloading the cars. When the ferry reaches the other side, the train rolls off the ship and once more continues on its way.

A *causeway*, or bridge, across the Strait of Canso, links Cape Breton Island with the mainland. A picture of this causeway is shown on the title page of this book. On the map on pages 22-23, trace all these sea links between the Atlantic Provinces.

Links under the sea • In 1858 the first trans-Atlantic telegraph cable was laid between Ireland and Newfoundland. Now telegraph cables, and telephone cables as well, connect all of the Atlantic Provinces with one another and with Britain and Europe. Over these cables speed business and friendly messages. Over them, too, travels much of the news in our daily papers. Sometimes storms at sea break a cable and interrupt the flow of messages. When that happens, the location of the break can be discovered fairly closely by means of electrical instruments. Immediately a cable repair ship, which is always

ready to sail on short notice, puts out from Halifax or St. John's, sails to the break, pulls up the cable, and makes the repairs.

Links in trans-Atlantic air travel • Alcock and Brown, the first men to fly across the North Atlantic, took off from Newfoundland when they made their famous flight in 1919. From that time on, landing fields in Newfoundland were used for aeroplanes crossing the Atlantic from England to North America. Since Newfoundland is the part of North America nearest to the British Isles, it is a stopping-place on air routes across the North Atlantic, where planes land to refuel.

Two airports serve this purpose: one at Gander Lake, the other at Goose Bay in Labrador. But transpolar flights and non-stop jet flights from inland cities are making these airports less important than formerly.

Other air links • The first radio message to cross the Atlantic reached St. John's in 1901. St. John's still has an important coastal signal station. At Sackville, in New Brunswick, one of the largest radio *transmitters* in North America flashes radio messages across the Atlantic.

LABRADOR

Look at the coloured map on pages 6-7 and find Labrador on the eastern coast of the mainland.

Labrador is a part of the Province of Newfoundland. It is a rocky land where few people live. The first settlers were fishermen who remained only for the summer season. Today families live there the year round. Most of them earn their living by fishing and trapping. Some work in the mines.

Inland, along the Hamilton River, there is wooded land, and waterfalls give promise of much electrical power. At present, little of this wealth is being used.

Recently great bodies of iron ore have been discovered near the Quebec-Labrador boundary. Quebec and Newfoundland are

working to develop the mineral resources of this area, and it may be that Labrador will one day become one of the world's chief sources of iron.

SOME THINGS TO DO • 1. On a table or sand tray set up any one of the following:

- (a) A New Brunswick lumber camp.
- (b) A Prince Edward Island fox farm.
- (c) A Nova Scotia fishing village.

Be sure to find out from pictures or books how everything should look. When you have finished, explain your project to your classmates.

2. Write a letter to a friend describing one of the following:

- (a) An apple orchard in the Annapolis Valley.
- (b) A dairy farm in the Minas Basin.
- (c) Gathering the potato harvest in the St. John Valley.

- (d) A visit to the paper mill at Corner Brook.
- (e) A trip to a coal mine at Glace Bay.
- (f) A visit to the wharves at Halifax.

You will have to use other books to do this. The list of books opposite should help you.

3. Re-read this chapter and make a list of all the advantages of the Atlantic Provinces. Then make another list of those things which hinder their progress. Their distance from the well-settled parts of the rest of Canada is one.

4. Where in the Atlantic Provinces would you be likely to find the following?

- (a) A rocky wave-washed coast.
- (b) The Parliament Building of Prince Edward Island.

- (c) The University of New Brunswick.
- (d) A steel mill.
- (e) A sugar refinery.
- (f) A cold storage warehouse.
- (g) A pulp mill.
- (h) A grain elevator.
- (i) A train ferry.
- (j) An iron mine.

5. Men like Bliss Carman and Charles G. D. Roberts have written poems and stories about the Atlantic Provinces. Perhaps you can find some of these. They will give you a good idea of what the countryside of these provinces is like. You may have read *Anne of Green Gables*, by L. M.

Montgomery, which describes life in Prince Edward Island.

6. On page 240 find the population figures for Halifax and Saint John. Do not try to remember the exact figures, but see how they compare with the population figure of your home town or city.

7. Newfoundland has a population of only about 458,000. Give as many reasons as you can think of to explain why so few people live on so large an island.

8. Try to find the story of Doctor Grenfell, the famous missionary to Labrador. In his book *Forty Years for Labrador* he tells much about the people and their many difficulties.

QUESTIONS TO ANSWER • 1. Why do most of the people of Newfoundland live along the coast?

2. Why is western Newfoundland more popular with tourists than eastern Newfoundland?

BOOKS FOR YOU TO READ • These books will tell you more about the Atlantic Provinces:

Jory's Cove, by CLARE BICE (Macmillan)

The Great Island, by CLARE BICE (Macmillan)

The Story of Nova Scotia, by PHYLLIS BLAKELEY (Dent)

The Story of Newfoundland, by FRANCES BRIFFET (Dent)

The Story of Newfoundland, Revised Edition, by J. A. COCHRANE and A. W. PARSONS (Ginn)

Billy Topsail and Company, by NORMAN DUNCAN (Revell)

Labrador Doctor, by NORMAN DUNCAN

BOOKS FOR THE TEACHER

Down in Nova Scotia, by CLARA DENNIS (Ryerson Press)

Bluenose: A Portrait of Nova Scotia, by DOROTHY DUNCAN (Collins)

Newfoundland, pamphlet from Geographical Branch, Department of Mines and Technical Surveys, Ottawa

To Nova Scotia, the Sunrise Province of Canada, by T. MORRIS LONGSTRETH (Ryerson Press)

Newfoundland Holiday, by J. H. SMITH (Ryerson Press)

Some Recent Changes in the Economy of Newfoundland, by W. E. GREENING (*Canadian Geographical Journal*, October 1957)



Courtesy of Canadian National Railways

Part of the harbour and city of Montreal, with Mount Royal in the background. Looking toward the St. Lawrence from the top of this hill, Jacques Cartier said that a great city would grow here.

THE PROVINCE OF QUEBEC

THE EARLY HISTORY

The coming of the French • After Jacques Cartier's voyage, about which you read in Chapter I, nothing was done to colonize Quebec until July, 1608, when Champlain started to build his *Habitation* at Quebec. He had chosen a pleasant spot at the foot of a high cliff, one where his settlers were not likely to go hungry. Berries splashed the bushes with bright colour. Plenty of fish and eels could be caught in the river. In the woods to the north were deer and moose. As soon as land was cleared, the settlers planted small gardens. For weeks the woods rang to the sound of axes as the men cut logs for three two-storey buildings and a storehouse to shelter the little company.

Then came a long, hard winter. Disease

broke out among Champlain's little band. One by one the men fell sick and died. When the snows melted and spring came, only eight of twenty-eight were left alive. An ordinary man would have lost heart and planned to return to his homeland, but Champlain was no ordinary man. He had the kind of brave pioneer spirit which has helped to make Canada the great country it is today. He refused to give up. In June his courage was rewarded: a French supply ship came sailing up the St. Lawrence.

With new men to keep the *Habitation* going, Champlain was free to join a band of friendly Indians who wanted his help against their enemies, the Iroquois. In this way he was able to explore the country beyond Quebec and find out where he could trade

for furs. In canoes the little band followed the St. Lawrence until they came to the mouth of the river now known as the Richelieu. Turning south, they paddled up this river to its source in a beautiful lake which now bears Champlain's name. Here they met the Iroquois and put them to flight — a victory which brought upon the French the hatred of these powerful tribes.

This was only one of the trips made by Champlain. On the Ottawa River, on Lake Huron, and on Lake Ontario he travelled, exploring, studying the habits of the Indians, and setting up little fur-trading posts. To tell the whole story of Champlain's adventures would take more space than this book will allow. By using other books, you will be able to find out more about this daring explorer, the founder of New France.

Other eager young Frenchmen followed Champlain's lead. These men did not themselves catch the beaver and other animals whose fur was so much prized. Instead they traded with the Indians. As soon as the ice thawed in the spring, the traders loaded their canoes with goods brought from France and set off, singing, for the Indian country. When they arrived at the regular meeting place, they quickly unloaded their canoes and spread their goods on stands built along the shore. There the Indians flocked to trade the furs they had trapped during the winter for guns and knives, tea and sugar, beads and blankets. When the trading was over, there was feasting and dancing. Finally the Frenchmen piled their furs into their canoes and started back on the long journey to Quebec. From there the furs were sent by ship to fur markets in France.

Talon develops the colony • In 1665 the King of France sent Jean Talon to take charge of the business of New France, which at this time had only about three thousand people. Talon was a very wise and clever man. He decided that the colony would never do well



Indians carrying Champlain's canoe over a short trail between two rivers.

unless it had a larger population. He persuaded the government of France to send out many new settlers. He also encouraged the young people of the colony to marry early, by refusing to allow unmarried men to take part in the fur trade.

To many of the new settlers Talon granted land. Each grant was called a *seigneurie*. Usually it included about a half mile of the shore of the river and ran back several miles. The *seigneurs*, as the men to whom the land was granted were called, had to clear the

Frenchmen trading with the Indians for furs. What sort of goods did they offer in exchange?



land and settle on it a number of tenant farmers.

Each of the tenant farmers wanted to have his farm touch the St. Lawrence, which was the main highway, since there were no roads through the thick forests which lined both banks of the river. This is how the long, narrow farms developed. Some of these are shown on page 55. Later on, many of the tenant farmers wished to divide their farms among their sons. Each son also wanted land on the river, and so the farms became narrower and narrower.

Talon imported into the colony sheep and cattle as well as horses. He encouraged the farmers to raise sheep for their wool. The farmer's wife spun the wool on a spinning wheel, then wove it into "homespun" cloth from which clothing was made. Talon urged the farmers to grow more grain and vegetables, so that the settlers need not depend on France for their food. He also started industries in the young colony, such as lumbering and shipbuilding. With the ships that were built, the people of New France were able to trade with the West Indies, exchanging fish and lumber for rum and molasses.

The coming of the English • From the time that Champlain set up his *Habitation* in New France, settlement by the hardy French pioneers was never entirely given up. They explored the new land far and wide, and finally claimed North America as far west as the Canadian Rockies and south along the Mississippi River to its mouth.

Meanwhile the English had settled in much greater numbers along the Atlantic coast, in what is now the United States. Finally a war in Europe between the French and the English spread to the colonies in the New World. France was unable to help her colonies along the St. Lawrence, and in 1759 New France passed into the hands of the English. The deciding battle was won on the Plains of Abraham behind the city of Quebec

by the English under Wolfe. Soon English colonists came to settle beside the French.

Since that time the population, both French and English, has increased greatly. Descendants of the early French settlers are now in every province of Canada, but in the Province of Quebec they form about nine-tenths of the population. This means that in some ways the Province of Quebec is different from the other provinces. All public notices in Quebec, such as those found along the highways and in railway stations, are printed in both French and English, and many of the laws of the province are those brought by Champlain and his followers from Old France. During the passing years, French and English have learned how to live and work side by side.

SOME MAP EXERCISES • Using the map of Southern Quebec on pages 58-59 and the map of Canada on pages 6-7, work out these exercises. Do not forget to study the legend on both maps. What part of the Province of Quebec is not shown on the map on pages 58-59?

1. Trace the boundary of Southern Quebec from Chaleur Bay to James Bay. Where is it an international boundary? Where is it a provincial boundary? What provinces border on Quebec?

2. Find the figures 45 to the left of the letter O in Ontario. These figures mark the 45th parallel of latitude, which is half way between the equator and the north pole. By moving your finger to the right from the figures 45 find the part of the boundary of southern Quebec which follows this line. What river does it cross?

3. Where does the boundary of Quebec follow a river? Name this river.

4. What part of the Province of Newfoundland lies to the east of northern Quebec?

5. What river divides Quebec in two? Trace its course from Lake Ontario to the Gulf of St. Lawrence.

6. What peninsula lies between the St. Lawrence River and Chaleur Bay?

A QUICK GLIMPSE OF QUEBEC

A province of many differences · Quebec is the largest province of Canada. It is larger than Alberta and Saskatchewan together, and much larger than the four Atlantic Provinces. In it live more than a quarter of all the people in Canada. Most of these people live near the great rivers of the province.

Suppose we begin our study of Quebec by visiting a few settled places in different parts of the province. These visits will show how differently people live within its boundaries.

First we shall go to a village near the St. Lawrence River. The houses are close together on either side of a long, shady street which follows the river. In the centre of the village is a large church with a tall spire, and close beside it is a school. Around these buildings are several cross streets and more houses, as well as a few shops and a post office. At one end of the village is a small

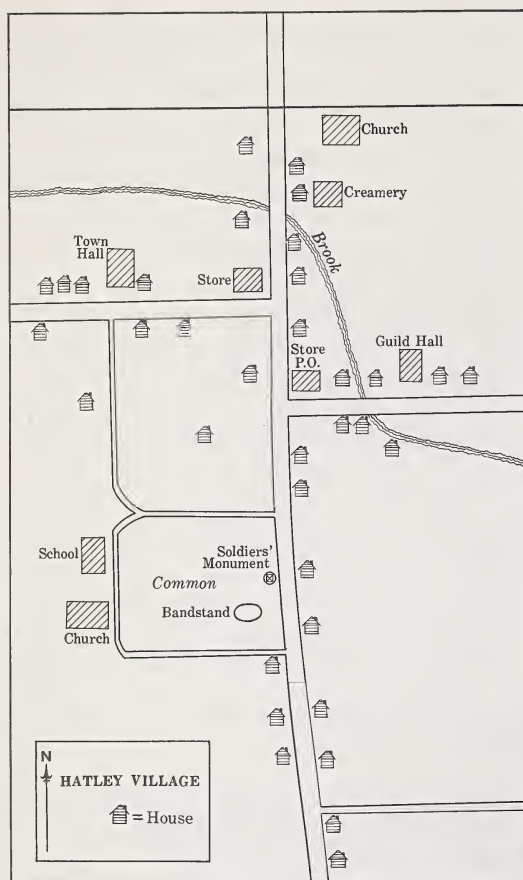
cemetery where the gravestones tell of people who were buried here as long as three hundred years ago. Back from the village stretch long, flat, ribbon-like fields. Each farm is narrow, about the width of a city block, but so long that the farmer has to go a mile or more to reach his "back lot." The people in this village all speak French.

Our next visit will be to another small village, but this village is among the hills. The people here all speak English. The first settlers came in from New England about 150 years ago. Today some of their descendants still live in and around the village. This village is not long and narrow like the first. It is almost the shape of a cross, because it grew up where two roads crossed. A large grassy square was laid out to look like the commons found in the towns of New England. On it face the school and a church. Another church is at the other end of the

A village on the lower St. Lawrence. Notice the long narrow fields divided by fences and the houses built close together along the main road.

Courtesy of Canadian National Railways





village, and there is a post office and the usual small general stores. The farms around this village are not long and narrow. Instead, they are nearly square, with fields of many shapes to fit the curves of the hillsides.

We have now visited in imagination two different kinds of villages. If we wished to travel farther, we might go to a new mining settlement in northern Quebec. This would be very different from the villages we have visited. Let us see what it might look like.

We should find that some of the houses are little more than shacks. There is no church as yet and no school. These are planned and will be built later. The roads are not surfaced, and so they are deep with mud, heavy with dust, or buried in snow. No shade trees

line the streets as in the older villages. One or two settlers have started tiny gardens in which a few vegetables grow. The whole place looks raw and dreary, but there is a hum of activity everywhere. In one place a bulldozer is clearing land, in another a large piece of mining machinery is being swung into place. In still another, men are putting up a house. Can you picture the changes that will take place in the next ten years or so?

If we were to visit a certain pulpmill town in northern Quebec, we should find this still different from the others. The mill, which must have plenty of cheap power and clean water for washing the pulp, is built near falls on a broad river. The town is on a wide "bench" or terrace, 150 feet above the river. To make life pleasant for the workers, the company that owns the mill has built a school, a clubhouse with a swimming pool, and attractive homes. Besides those men who work for the company, there are store-keepers, fur traders to whom the trappers bring their skins in the spring, and workers on the railway which runs through the town. As it is almost 80 miles to the nearest town of any size, the people who live here cannot often "go outside," as they say. Fresh vegetables, fruit, and milk are expensive, since they must be carried a long distance by train or truck. Some townspeople have small gardens, but because the soil is poor and sandy and the growing season short, gardening is not very successful.

How different is the life of the people in the settlements that we have visited. Yet they are all in Quebec! Nor is this by any means all the variety we can find. There are crowded cities like Montreal and Quebec, where life is not at all like that in any of these villages. Again, away to the north, we find wandering bands of Indians, who make a living by trapping. Still farther north, on the shore of Hudson Bay or Ungava Bay, are Eskimos. They, too, live in Quebec.

THE PEOPLE OF QUEBEC

Now let us look for a minute at the people we have seen. In many small towns and villages, like the first that we visited, everyone speaks French. In one village we saw that there were only English-speaking people, but this is rare. In many other towns we could find both French-speaking and English-speaking Canadians, living and working side by side. In the mining town we would be sure to find Poles, Italians, and Austrians, while in the pulpmill town we would find Swedes and Norwegians, as well as numbers of office workers from the United States. In large cities, like Montreal, there are people from almost every country on earth. In the far north are Indians and Eskimos — the first Canadians.

If someone were to ask you, "Who are the people of Quebec?" the answer would not be easy. First of all they are *Canadians*: whether they speak French or English, Italian or Russian. If they were born in Canada, or if they have taken the oath to be loyal citizens of Canada, they are Canadians, as we are.

A new town on the Bersimis River in the Laurentian Upland. Notice the worn-down mountains and the wide glacier-carved valley.

In Quebec Province the French-speaking group is by far the largest — larger than all the other groups together. Except for the Eastern Townships and the south-west corner of the province around Huntingdon and Ormstown, the French cleared the land and built the first settlements. Their descendants now form about four-fifths of the whole population of the province.

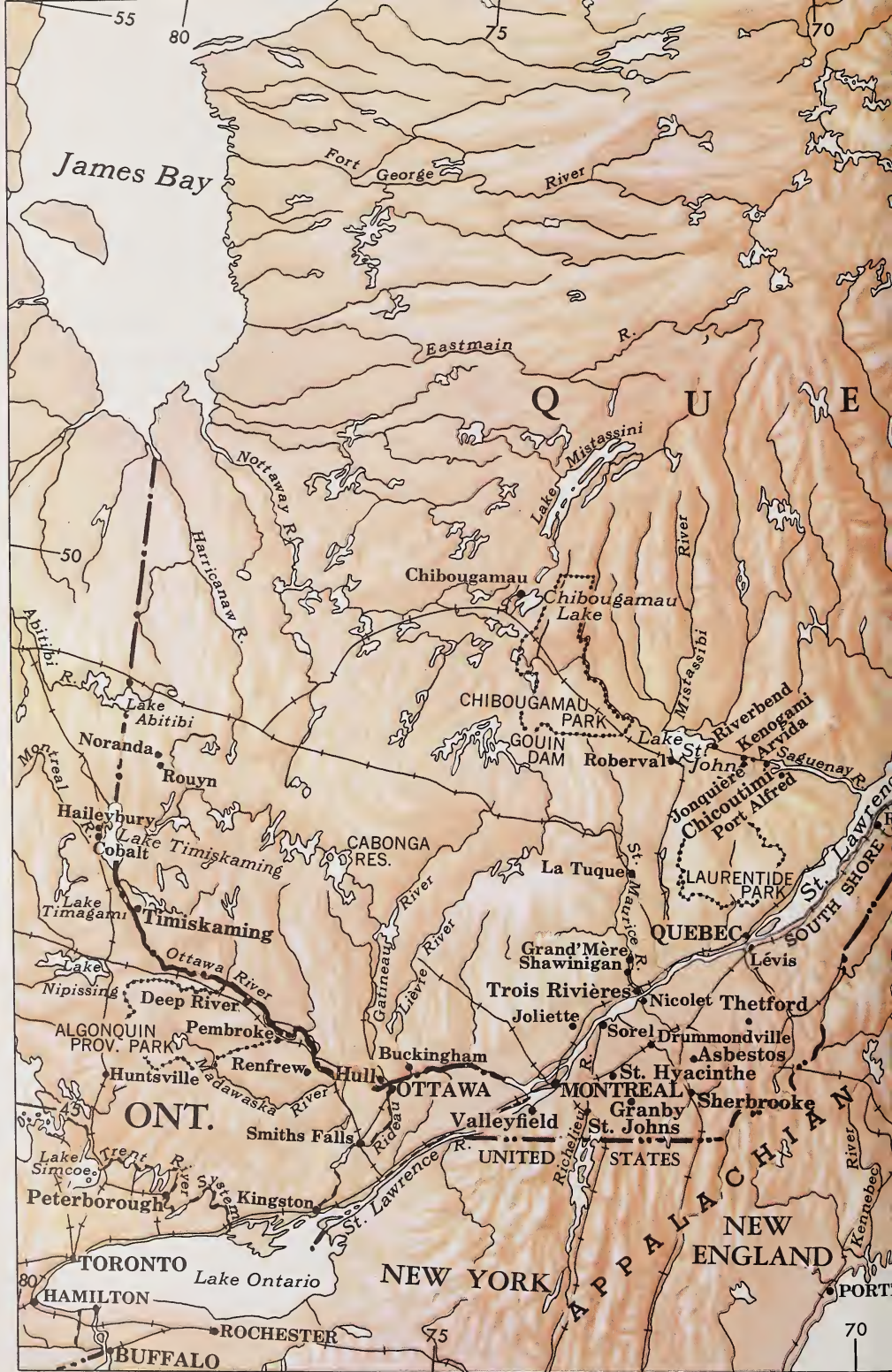
THE PHYSICAL REGIONS OF QUEBEC

The Laurentian Upland

A region changed by glaciers • As you read in Chapter I, the Laurentian Upland covers nearly all of Quebec. This region is one of stumps of worn-down mountains made up of old, hard rock. Thousands of years ago a great ice sheet covered this part of Canada. *Glaciers*, or rivers of ice, flowed from the ice sheet toward the coast. As the ice moved slowly forward, it ground off, bit by bit, the surface of the ancient mountains already worn down through millions of years, and carried soil, sand, and rocks far to the south, even into the United States. The glaciers

International Harvester Photo







deepened the valleys in which many of the rivers now flow. Ice blocked other rivers and changed their courses, and it deepened hollows now filled by lakes.

After a very long time, the weather grew warmer and the ice began to melt. The melting began along the southern edge of the ice sheet. It continued farther and farther north, until now the ice sheet and the glaciers have disappeared entirely from the Province of Quebec. Small ice sheets are still found on Baffin Island to the north and in the Rocky Mountains. These, and the enormous ice sheet which almost covers Greenland, remain to remind us of a time when Canada was in the Ice Age.

When the hills were free of ice they had, at first, no soil on them, but in the hollows the glacier had left sand, clay, and gravel, worn from the rocks over which it had passed. In this, moss, plants, bushes, and finally trees began to grow, until today forests cover much of the region. Great dark forests of spruce, pine, and hemlock, stretch mile after mile. These conifers have needles in place of broad leaves. There are a few broad-leaved trees, such as alders, birches, and poplars, but there are no oaks, elms, or many of the other trees which you know. Of course you may wonder why conifers will grow where oaks and elms will not grow. Partly it is because conifers spread out their roots near the surface, even over rocks, while oaks, maples, and other broad-leaved trees need deep, rich soil. Also, broad-leaved trees need more rainfall and a longer growing season to produce their seeds, large leaves, and tall trunks. For these reasons, then, this is the land of Christmas trees!

A region of valuable forests • Let us pretend that we are standing on the top of one of the many hills or "mountains," as they are usually called, in the country north of the St. Lawrence. In every direction we see hills, most of them of about the same height as the

one on which we are standing. Some are quite bare on top, and others show ledges of rock between the trees. Below us lies a deep valley in which there is a river of sparkling water. At one place in the river a stretch of foaming water shows that there are rapids. Across the valley we can see a waterfall, where a stream plunges over a rocky ledge. In imagination we can see the fur traders of long ago making a portage around these falls.

On a nearby hill is a steel tower with a little house at its base. That is a *fire tower*, which the *forest ranger* climbs to look for signs of forest fires. Every year these fires destroy great areas of forest and cause millions of dollars of loss. At the first signs of smoke, the ranger gives the alarm and fire-fighters rush to the spot by truck, by aeroplane, or by helicopter, to stop the fire from spreading.

From our hilltop we can count five lakes, but in all this wilderness of forest, lakes, and mountains we can see only one poor farm. It has a little plot of cleared land protected by a rail fence, a small wooden house, and a tiny stable. "This seems to be no country for farming," you will say to yourself, and you are quite right. Look again at the physical map on page 13 and trace out the whole region of the Laurentian Upland. By far the larger part of this great region is not suited to farming. There are only a few areas, like the Clay Belt of northwestern Quebec and the district around Lake St. John, where crops of potatoes, oats, hay and hardy vegetables can be raised.

The Laurentian Upland, with its thin, poor soil, may not be useful for farming, but it is of great value for its forests. Some of the wood is used for lumber, much is burned for firewood, and much of the softwood, especially spruce, is used for pulp.

The pulp and paper industry • The pulpwood logs are cut and floated down the rivers to mills, where they are ground and made into pulp. There are many pulp and paper mills



Service de Cine-Photographie, Province de Quebec

A farm in the Lake St. John District. Long ago the land here was the flat bottom of a lake.

in the northern part of Quebec, especially along the south-flowing tributaries of the St. Lawrence. On the map on pages 58-59, see how many of these rivers you can find. Name them. On the maps on pages 58-59, 64, and 66, find the towns of Hull, Timiskaming, and Buckingham on the Ottawa River; La Tuque, Grand'Mère, Shawinigan Falls, and Trois Rivières on the St. Maurice; Riverbend, Port Alfred, Jonquière, and Kenogami on the Saguenay. All these towns have pulp mills or pulp and paper mills. Beyond the Saguenay on the north shore of the St. Lawrence is Baie Comeau, also a paper-mill town. Do not try to remember all these names, but notice the location of the towns on the rivers.

Canada exports more *newsprint*, or paper on which newspapers are printed, than any other country in the world, and Quebec makes more of this newsprint than all of the other provinces together. It would be interesting to visit a paper mill and to see how the work is carried on. This is what a paper-mill worker has to say about his work.

"My name is Lars Larsen. I work in the shipping room at our mill, checking off the

big rolls of newsprint as they are loaded into the box cars for shipment. Often I wish that I might follow some of these rolls of paper; they would lead me to many corners of the world. Sometimes, too, I go out behind the mill and watch the never-ending procession of spruce and balsam logs entering the mill. Then I think of the great forests away up the St. Maurice River where the trees grow, and the exciting trip the logs had down the river

Pulp logs being hauled out of a river after their trip downstream to a pulp and paper mill.

The E. B. Eddy Company, Limited





Courtesy of Canadian National Railways

A mill at Riverbend. Notice the log pile, conveyor belts, and the barking drums in the foreground.

to the mill. But that is not the story you asked me to tell you. You want to know what happens from the time that the logs enter the mill until they leave it as rolls of newsprint.

"First of all, the logs go to a *barking drum*, which tumbles them about and so rubs the bark off. Water is sprayed over the logs, and this washes the bark out between the slats in the drum. The logs then pass along a conveyor belt where inspectors discard any that still have bark on them. These discarded logs are returned to the barking drum.

"The next machine, the *borer*, digs out knots and decayed spots in the wood. All logs, no matter what kind or for what purpose, go through these first processes, but from this point on we have two different methods of making pulp, out of which paper will be made later. One is called the *mechanical* and the other the *sulphite* process.

"In the mechanical process the clean, smooth logs are pressed against large turning grindstones, which crush them to pulp — a mixture of wood fibres and water. Streams of

water wash the pulp away. The mixture is passed through screens to remove any coarse fibres and dirt. Some of the water is drained off and the pulp is then stored in huge storage tanks. This kind of pulp alone does not make very strong paper, because the fibres are very short. Therefore, it has some long-fibred sulphite pulp mixed with it before it goes to the paper machine.

"In the sulphite process the logs go to a *chipper*, which slices them up into small, thin chips. The chips then go to huge *digesters*, sometimes fifty feet high, where they are cooked in a chemical liquid for eight hours or more. The liquid pulp is then blown out by steam pressure into a *blow pit*. There it is washed and strained until nothing remains but the pure fibres of wood called *cellulose*.

"If white paper is wanted, the mixture must now be bleached by a chemical. With newsprint, however, no bleaching is done.

"Mechanical and sulphite pulps are mixed together to form the *stock*, which is now ready for the paper machine. A newsprint machine

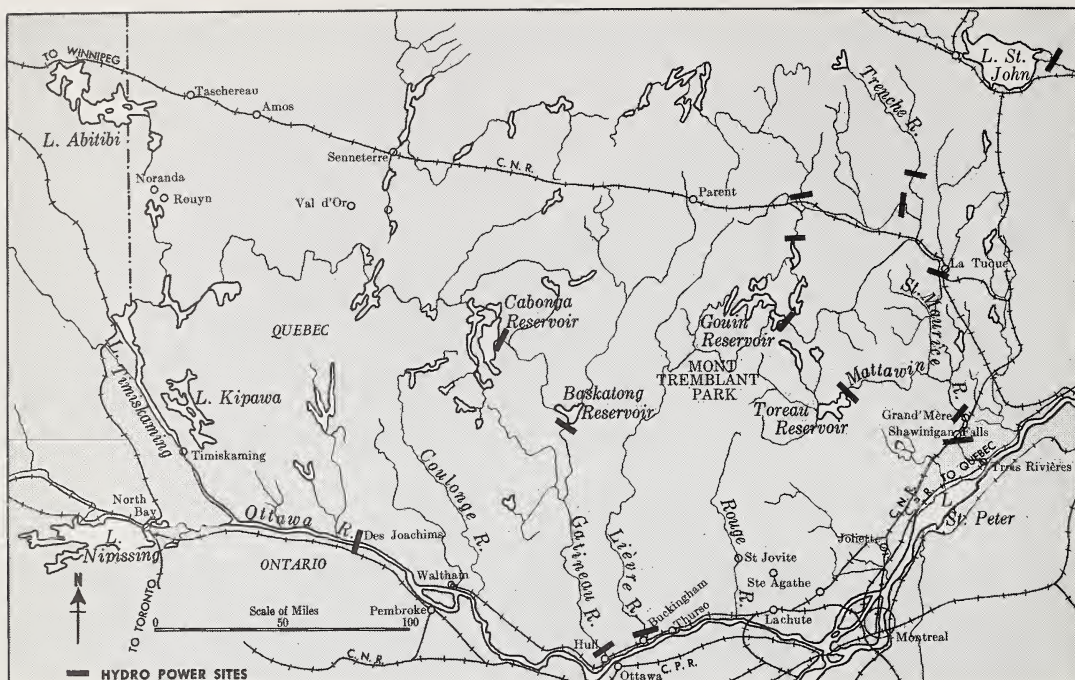
is as long as a football field, and is made up of many metal rollers, some of which are hollow and filled with steam. When the stock enters the 'wet end' of the machine, it is carried for a short distance on a wire screen which allows most of the water to drain away quickly. Later it is carried by a belt of wool felt, which absorbs much of the remaining moisture. Farther along still, the rollers are heated to finish the drying. What finally comes out at the 'dry end' of the paper machine is no longer watery pulp but paper. Before the paper leaves the machine, it is smoothed or 'ironed,' and then wound on

long cores. At last it is ready to be wrapped for shipment.

"It always surprises visitors at the mill to see how fast the paper machine works. It is nothing to turn out a mile of paper in four or five minutes. And speaking of visitors, the question they nearly all ask is, 'What is the cause of the strong, disagreeable smell around the mill?' This smell arises while the liquid used in the sulphite process is being prepared. Limestone, sulphur, and water are used in making the cooking liquid and it is the sulphur fumes that we smell. Some of this sulphur, which you can see in gleaming

A paper mill at Trois Rivières. Notice the logs stored in booms up the river. Could the discharge of wastes from the side of the mill be harmful?





The Ottawa and St. Maurice Valleys.

yellow piles in the mill yards, comes all the way from the southern United States, near the Gulf of Mexico. Much is also now produced in Canada.

"The next time that you boys and girls see your dad reading his morning paper, you may remember the numbers of men and machines that were needed to manufacture the newsprint."

In addition to newsprint, many other kinds of paper are made from pulp. These include writing paper, wrapping paper, and paper board. Still other kinds of paper are made for manufacturing paper plates and cups, paper bags, and so on. Rayon, which is used for dresses, underwear, and stockings, is also made from woodpulp. At Shawinigan Falls there is a factory in which cellophane, plastics, and many other articles both useful and beautiful, are made from woodpulp.

Power for mills and factories · The pulp mills and other manufacturing plants of the

Laurentian Upland need a tremendous amount of power to run their machinery. Although Quebec lacks coal and oil, it has plenty of water power due to the many falls and rapids in its rivers. The water is led from above the falls through large pipes to the power house. There it drops down a well-like pipe in which is a propeller. The force of the water striking against the blades of the propeller makes it spin very fast, much as the blades of an electric fan spin when the fan is in motion. This produces a current of electricity. This electrical current may then be carried a long distance to light our houses or turn the wheels of our factories. Power produced in this way is called *hydro-electric power*. Quebec produces more hydro-electric power than any of the other provinces.

HOW GOOD ARE YOUR EYES? On the maps on pages 64 and 66, locate the Ottawa River, with its tributaries the Gatineau and the Lièvre;

the St. Maurice, the Saguenay, and the Bersimis rivers. On these rivers find as many power plants as you can. Notice how many times the water of the St. Maurice River is used to produce power. Locate the Gouin Dam at the head of the St. Maurice River. Its use is rather different from that of other dams on the river. Its purpose is to hold back the water that would otherwise run to waste during the spring or during a period of heavy rain. As the volume of the river shrinks during dry weather, the *gates* are opened, the stored-up water runs out, and the power plants and pulp mills down the river can continue to operate. How many other storage dams can you locate on the map?

Cheap power • Because there is much hydro-electric power in Quebec, electricity is cheap. Factories are built where power is cheap, and where easy transportation by water or rail makes it possible to bring in raw materials and ship out manufactured products.

One of the most recent power developments is on the Bersimis River. (See the picture on page 57.) From the power plant the electricity is carried by cable under the St. Lawrence River to the copper mines at

Murdochville in Gaspé. Power lines also carry electricity from this power plant to Quebec City and Montreal.

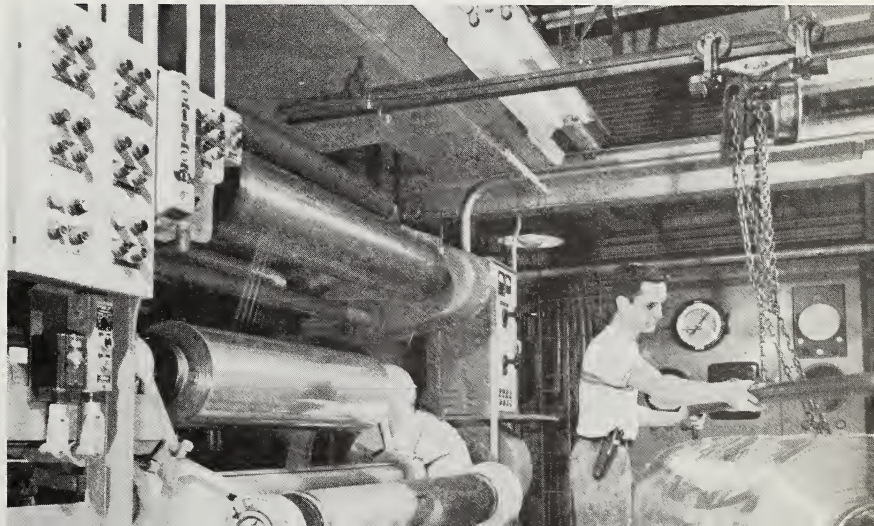
THINGS TO DO • 1. Make a poster warning of the dangers of forest fires.

2. In countries like Sweden, Germany, and Japan, all forests are cared for by the government. Only certain trees may be cut, and others must be planted to take their places. The forests are also kept clear of *slash*, or the waste branches and leaves. Canada is learning to follow this plan. Make a list of the reasons why you think that *forest conservation*, as this care of the forest is called, is important. Add to your list the fact that when forests are cut down, many of the streams dry up. This is because trees shade the ground and help by means of their roots to hold in place the soil which contains moisture.

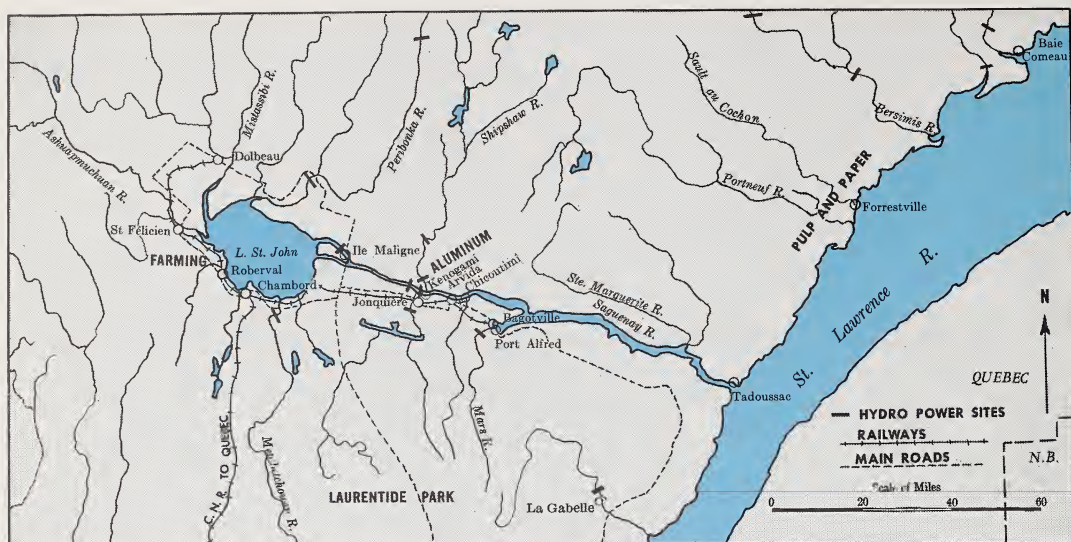
3. Explain what is meant by hydro-electric power. Of what value is it to Quebec?

The Saguenay Valley • Unlike the other tributaries of the St. Lawrence, the Saguenay River can be used by large steamers. During the Ice Age a glacier deepened its channel so that ocean-going steamers can go up

A finished roll of
cellophane made in a
Shawinigan plant.



Du Pont of Canada Photo



The Saguenay Valley.

it as far as Chicoutimi and Port Alfred. Beyond this, falls and rapids make possible enormous power developments. These supply electricity to pulp and paper mills and to the huge aluminum plants at Arvida and Ile Malgine. Cheap power and easy transportation were the reasons for choosing this location for the aluminum plants. The two raw materials used in making aluminum are brought by boat, one from South America and the other from Greenland. Another great aluminum plant has now been established at Baie Comeau. It uses power from the Manicouagan River.

Another search • Using the map above, find other means of making a living in the Saguenay Valley. Do not miss the farming region around Lake St. John. This is well cultivated farmland surrounded by a wilderness of forests and hills. This low flat land was once the floor of a much larger lake.

The fur industry • You all know that when the French first settled in Canada they began trading in furs with the Indians. There is still much trading in furs, but we do not hear so much about it as we used to. Year by year

the wild fur-bearing animals are becoming fewer in numbers; but Indians, and white men too, still roam the northern forests, setting their traps and visiting their trap lines. The government lets them trap only in certain seasons, so that the fur-bearing animals will not disappear entirely.

Trapping is a lonely life, since the trapper, to find the wild animals, must leave home and civilization. In the spring he comes in to one of the trading posts (the Hudson's Bay Company still has many through the north country) and sells his furs, buying supplies to last him for the next year. The most common means of travelling are still by canoe in summer and by dog team in winter, although loads of furs are sometimes brought out from the trading posts by aeroplane.

A tourist region • In recent years the more southerly wooded parts of the Laurentian Upland have become popular with tourists. Campers in summer, hunters in autumn, skiers in the winter, and fishermen in the late spring and summer are using and enjoying this part of Quebec.

The many lakes and rivers make it possible

to travel by canoe in almost any direction. Many of the lakes fill rock basins scraped out by the movements of the great ice sheet which covered this part of Canada. Because these rock basins hold little mud and gravel, the water of the lakes is clear and pure. In such lakes trout, the finest of all game fish, are plentiful.

National and provincial parks aim at keeping many hundreds of square miles as unspoiled playgrounds. The Laurentide and Chibougamau parks are best known for their fishing. Mont Tremblant Park is famous as a skiing resort.

SOMETHING TO DO • 1. Using your maps, plan a canoe trip from Trois Rivières to James Bay. Choose the shortest route you can find and try to avoid long portages. If you are not sure what a portage means, see the picture on page 53.

Write a description of what you should see on the way. Use your maps carefully, and notice when you are among the high hills and when you come out on to the low plain south of James Bay. Don't forget to mention the mosquitoes and the black flies if you plan to go in summer. There are millions of them!

2. Ask your teacher to help you find out all



National Film Board Photograph

Indians setting a trap for beavers in Northern Quebec.

you can about beavers. Perhaps you have read one of the books that Grey Owl wrote about his beavers. In the old days there were many beavers in the Province of Quebec. Trapping reduced their numbers so that at one time few were left. The government, however, passed laws forbidding for a time the trapping of these animals and their numbers are now increasing.

Aluminum Company of Canada, Ltd.

The great Shipshaw power plant, one of the reasons why power is cheap in the Saguenay Valley. In the foreground is the world's first all-aluminum bridge.



The hidden wealth of the Laurentian Upland • In the rocks of this region is a great wealth of minerals. Much of this area, however, is still unexplored, and minerals in huge amounts may still be lying hidden, just as they have been for long ages, waiting for men to come and find them.

In western Quebec an important mining region stretches eastwards from Rouyn and Noranda, near the Ontario border. Turn to the map on page 141 and find the chief mining regions of Quebec. If you were to visit the Noranda-Rouyn region, you would see mine after mine for miles. Here gold and copper are being mined by many different companies. Zinc is also found in great quantities, but at present the more precious gold and copper are getting the most attention. A smelter at Noranda removes the ores from the rock in which they are found. The *blister copper* is then sent to the refinery in Montreal East to be purified. From the *slag*, or waste products of the smelter, sulphur is produced.

It is like a fairy story the way that this mining district has developed. Not long ago it was quite unsettled; today thousands of people are living in towns that are growing larger day by day.

Another region that has been opened up rapidly is Chibougamau, between Lake St. John and James Bay. Gold and copper are found in this region too. At first the miners and all their machinery had to be flown in. Now roads and a railway have been built to link this district with the Lake St. John and the Rouyn-Noranda districts.

In the Ottawa Valley mica, magnesite, and graphite are mined. These minerals remain unchanged under great heat. Mica is used in making electrical goods such as toasters and flatirons. Magnesite is used to line electric furnaces. In your dictionary find the uses for graphite.

Two busy mining areas lie far to the east in northern Quebec. One, near the Labrador boundary, has enormous amounts of iron ore. The ore here is so near the surface that it can

Noranda. Look for the three headframes of the mines on the right. The tall smoke stacks belong to the smelter.

Courtesy of Canadian National Railways



A train bringing iron ore from Schefferville to Sept Iles. Find this railway on the map on pages 58-59.



Iron Ore Company of Canada

be dug out with steam shovels. It is then carried by railway to the port of Sept Iles on the St. Lawrence. There, modern machinery dumps the cars and loads the ore onto steamers. Most of the ore goes to the United States, by way of the Atlantic route to eastern ports, by the St. Lawrence Seaway, or by rail to inland steel centres. A small amount goes to Canadian steel mills, and some also goes to Europe. Do you remember where other large iron mines are found in eastern Canada?

The other mining area in what is called "New Quebec" lies near Allard Lake. Here an ore is found which produces not only iron, but titanium. The ore is shipped for refining to Sorel, at the mouth of the Richelieu River. Titanium is used in making paints and for light, strong metal work.

Manufacturing and cities • You have already read of the pulp and paper industry of the Laurentian Upland, and of the aluminum works in the Saguenay Valley. These depend on cheap and plentiful power as well as good transportation. Other important manufactures are matches and cement at Hull,

chemicals and aluminum at Shawinigan Falls, and textiles at Grand'Mère and Shawinigan Falls. Can you give reasons for the placing of these industries? Find on your maps the places mentioned.

THINGS TO DO • 1. Now you should be able to answer the question, "Why do so few people live in so large an area as northern Quebec?"

2. Quite often this sentence appears in the newspaper: "Canada wants men." What kind of workers could be used in northern Quebec? What kind of workers would be of little use there?

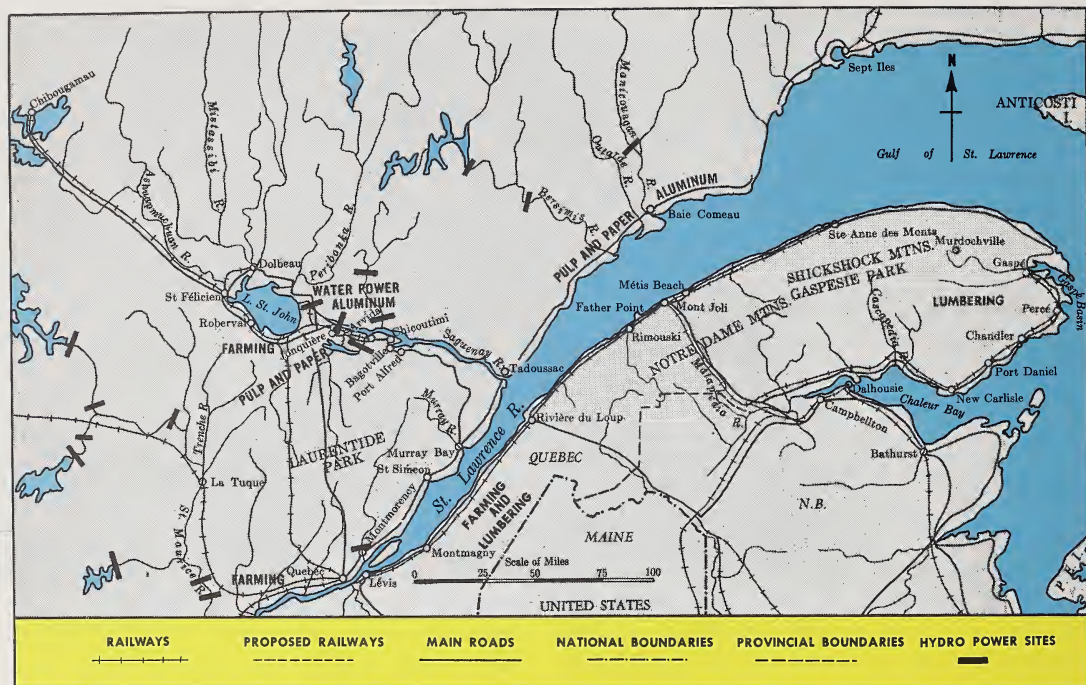
3. Below is a list of towns of northern Quebec. How many of the industries in the second list are carried on in each? Which town is a port?

Towns

Arvida	Grand'Mère	La Tuque
Shawinigan Falls	Hull	Kenogami
Noranda	Sept Iles	

Industries

Power development	Mining
Aluminum	Pulp and paper
Matches	Making of
Textiles	cellophane
When you have finished, check your answers with your book.	



The lower St. Lawrence and the Gaspé Peninsula.

The Appalachian Region

A region of low mountains • From northern Quebec we shall now go to the hilly country south of the St. Lawrence. This is part of the Appalachian Region which stretches northward through the eastern United States and across Quebec to the tip of the Gaspé Peninsula. The mountains rise like great folds. Some reach a height of 4000 feet, but many are much lower. The tops have been worn off by rain, wind, and frost, and also by ice, for the great ice sheet covered much of this region as well as northern Quebec. The mountains are smoother and more rounded than the Laurentians, and are usually forest-covered to the top. Between the mountain ridges are fertile valleys and many lakes, making beautiful scenery.

The climate in this part of the province is not so severe as that in northern Quebec; the winters are not so cold and the summers, except in the Gaspé Peninsula, are longer.

But here, too, there is much snow, and the spring is late.

The soil in many of the valleys is good, but on the hillsides it is poor and thin. It is not at all unusual to see stone fences bordering the fields and hillside pastures. The stones used in making them were left by the melting ice sheet.

The Gaspé Peninsula • Let us see what the map above shows us. Notice how you can tell by the rivers that the highest part of the peninsula lies near the northern shore. Mount Jacques Cartier, 4450 feet high, is the highest point in southern Canada east of the Rockies. It was on the opposite side of the peninsula, at the head of Gaspé Basin, that Cartier landed in 1534 and set up a cross on the shore, claiming the land for the King of France.

The Gaspé Peninsula, which stretches out into the Gulf of St. Lawrence, is in many ways like the Atlantic Provinces. Fishing is

very important to the people. Along its north shore, the fishermen live in tiny villages facing the river, with high cliffs or mountains rising behind them. No railway reaches them, but a motor road circles the peninsula, bringing tourists and artists to enjoy the scenery. Gaspé Basin forms a fine, large harbour, but since there are no important industries, a large port has not grown around the harbour. What is the difference between a harbour and a port?

Not far away is the copper-mining town of Murdochville. As you read on page 65, this town and its mines get their power and light by cable from the north shore of the St. Lawrence. A short railway carries the ore to a harbour on the north shore of the peninsula, while a road links the town with Gaspé Village.

Along the south shore of the peninsula, life is not so hard. A railway serves the people who live there. Lumbering gives work to many men in Gaspé, as in New Brunswick.

Some farming is carried on, but farms are small and hilly, the soil is thin, and the

growing season is short. In recent years it has been found that very fine green peas can be grown in some of the sheltered valleys of southern Gaspé. The peas are shipped away fresh, frozen, or canned. Strawberries and blueberries too, grow well. Because the season is late in Gaspé, they bring good prices in Montreal and New England, when all other such berries are gone.

Many of the south-flowing rivers and the small lakes that they drain are leased by fishing clubs or sportsmen, who want to protect and enjoy the splendid salmon and trout fishing. These sportsmen give work to men who act as guides or as caretakers of the camps and lodges.

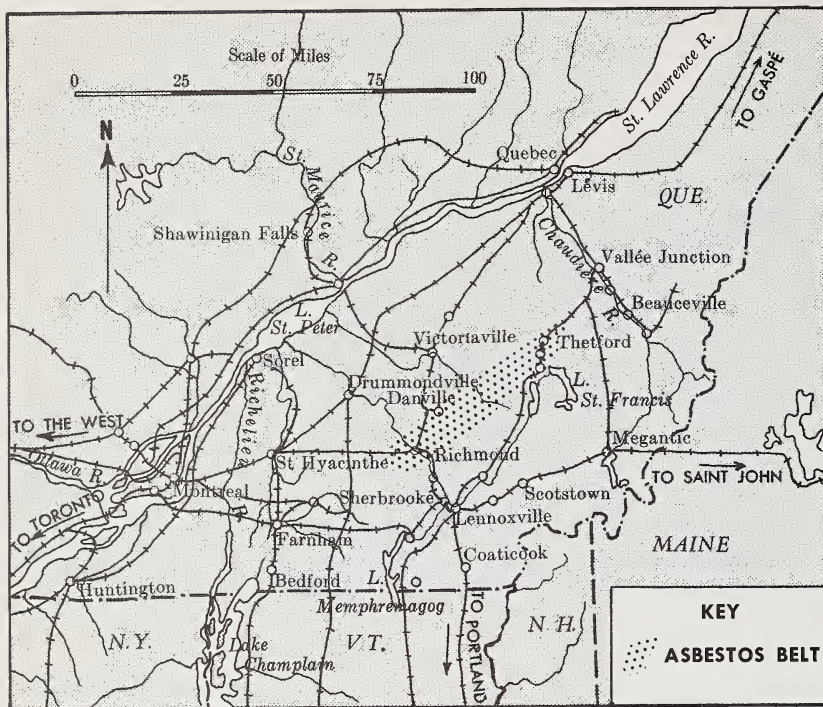
Between the Gaspé Peninsula and Levis is more lumbering and farming country, usually spoken of as the "South Shore." Here, too, the land is hilly and farms are small. In order to make a living, farmers must work in the woods during the winter.

Along the St. Lawrence, which is here very wide, seaside resorts are found. It may sound strange to hear of seaside resorts so

Farms and forests on the hillsides around Gaspé Bay.

Courtesy of Canadian National Railways





*The Eastern Townships
and the
Chaudière Valley.*

far inland, but the water of the St. Lawrence is salt almost as far up the river as Quebec. Ferry-boats and aeroplanes link the South Shore railway to towns on the North Shore. Because of this, the increased mining activity of the North Shore has brought prosperity to the South Shore. At Father Point near Rimouski all ships going up the river must take on a river pilot. Manufacturing industries are springing up on the South Shore. Many of these depend on forest products.

The Chaudière Valley • On the map above, find the Chaudière Valley. Few people live in this beautiful valley. Those who do make a living by lumbering, farming, and small industries. The Chaudière River route links with that of the Kennebec in Maine. It was travelled by the Indians before the white man came. Today a highway follows this same route. It is much used by tourists from the United States on their way to Quebec.

About half a mile from where the Chaudière joins the St. Lawrence, it tumbles in falls from the high, level plateau onto the St. Lawrence Lowland.

The Eastern Townships • The most fertile part of the Appalachian Region of Quebec, and the part that has the most people, is the Eastern Townships. As you have read, the greater part of the Province of Quebec was settled by the French. Until after the English came, all the land was divided up into seigneuries. These seigneuries were then cut up into long strips facing on a river. In this way the land along the St. Lawrence, the Richelieu, and the Chaudière was settled. Find these rivers on the map on this page. After the American Revolution, the block of land between these rivers and the southern boundary of the province was divided into townships and settled by people from the United States, England, Scotland, and Ire-

land. This region is known as the Eastern Townships. Although it was settled by English-speaking people, the population is now mostly French-speaking.

The first business of the settlers was farming. In the fertile valleys they were able to raise good crops of oats, barley, potatoes, vegetables, and hay. Because fodder crops could be raised to feed the animals, dairying soon became important, and cheese factories and butter factories were built. One of the first railways in Canada passed through the Townships. This was the one joining Montreal with Portland, in Maine, the nearest winter port. This railway made it possible to ship milk, cream, and eggs to the many cities of the New England States. The lower hillsides were used for pastures, and today more sheep are found here than in other parts of the province.

Since the hillsides were covered with forests, lumbering was, and still is, important. Sawmills, shingle mills, and later pulpmills were built near the streams, as well as mills making *plywood* and *veneer*. Veneer is a thin layer of wood peeled from a log by machinery. Plywood is made by glueing several of such layers together and then placing them in a great press. The best grades of

veneer are used for furniture, the poorer grades are used for fruit boxes and baskets.

On the St. Francis, the largest river of the Townships, are falls and rapids. Most of the smaller rivers, too, have falls. This led to the development of water power and the beginning of manufacturing.

Study the map on page 72 and find the St. Francis River. Notice that this river rises in Lake St. Francis. From the lake it flows southwest between two ridges of hills. Then, three miles south of Sherbrooke, it turns northwest and cuts through a third ridge of hills. At Drummondville it leaves the highland, flows down onto the St. Lawrence Lowland, and empties into Lake St. Peter. (See the diagram on page 79.)

As you can see by the railway pattern, Sherbrooke, on the St. Francis River, is the most important centre of this region. The many small valleys which meet there allow the main highways and railway lines, joining Quebec and Montreal with the eastern Atlantic ports, to pass through the city.

Manufacturing in Sherbrooke and district. Because the United States is near, the railways can easily bring in raw materials from that country for manufacturing. These materials include iron and steel to be made into ma-

Rolling farmland in the Eastern Townships.

Courtesy of Canadian National Railways



chinery, and cotton to be made into thread, knitted goods, and sheets. Wool, from sheep raised in the Townships and in faraway Australia, is made into woollen cloth and blankets. Raw rubber is made into rubber heels and footwear. Stockings, gloves, and other knitted goods are made from nylon, rayon, silk, and cotton.

Many of the smaller towns have industries like those of Sherbrooke. Pulp and paper mills, and textile mills making cotton, rayon, silk, and woollen goods are the most important. Veneer and other wood-working plants are also common.

Asbestos mining. There are few minerals in the Eastern Townships, but among the hills is found a certain kind of hard rock through which run bands of asbestos. The French sometimes call this queer mineral *pierre à coton*, or "cotton stone." It is a good name, because the rock peels off into fibres much like cotton. Asbestos will not burn, so it has many uses. It is wrapped around furnaces, to keep the heat in; it is made into coats and gloves for firemen, to keep the heat out. Asbestos shingles keep heat out in summer and in during the winter. Asbestos is also used in jet planes and as lining for the brakes in trucks and automobiles. Canada produces more asbestos than any other country in the world, and most of it comes from the Eastern Townships.

On your map locate the places where asbestos is mined. Some of the rock is dug out of the earth leaving large open pits. More is now mined underground, much as coal is mined in Nova Scotia. The most important asbestos towns are Asbestos, Thetford Mines, and Black Lake.

A worker in a mine at Asbestos is glad to tell us the story of how asbestos is mined and made ready for manufacture.

"I work in the big crushing plant, but since my father and brother work in other parts of the mine, I know what goes on from

the time blasting begins, until the bags of asbestos fibre leave the mill.

"First, I must tell you about the pit at our mine. It is about 300 feet deep, and 300 feet down into the earth is a long way. A friend of mine went to see the great Niagara Falls that we hear about, and when he came back he said, 'Jean Paul, you should see those falls, 150 feet from top to bottom!' I just laughed at him. 'Ho, Henri, that is nothing at all. You could stand two Niagara Falls one on top of the other in our mine pit!'

"Well, to get back to my story. The men who start the work are the drillers; they go down into the pit, and with their noisy drills they bore holes. Later they pack these holes with dynamite, and lay the fuses to set off the explosive. Then the foreman blows a warning siren and all the men must hurry to safety shelters. The blast is set off by an electric current. Soon there is a big bang as the dynamite explodes, flinging pieces of rock into the air. When the dust has cleared, electric shovels load the ore into huge trucks, which carry it to the mill.

"Today only about a quarter of the ore that we mine comes from the pit. The rest comes from an underground mine. There the ore is cut out in great blocks. A small slice is blasted out at the bottom of each of these. Then, *pouff!* the whole block tumbles down, breaking as it falls. The broken pieces slide through holes into a tunnel beneath. There a scraper pushes them through a big hole in the floor of this tunnel and lands them into a ten-ton car in the tunnel beneath. The loaded cars, ten at a time, are hauled by an electric locomotive to a crusher, where the rock is broken up. After that, the crushed rock is hoisted to the surface and taken to the mill.

"At the crusher building, where I work, the ore is ground into small pieces, sorted, and crushed a second time. Then it is sent

over moving 'screens,' where the asbestos is separated from the sand and grit. After that it is graded and bagged, to be sent to the United States, Britain, and many other countries. The *tailings*, as the waste material is called, are carried away to a hollow in a valley near the mine. No mountain-like heaps, such as those at Thetford Mines, are seen around our mill.

"The trouble with the mine pits is that they grow too fast. In Thetford Mines, where the oldest pits are found, part of the town was in danger of sliding into the pit or mine shafts. Mills, houses, stores, streets, railway tracks, station, and freight sheds — all these had to be moved. The mining companies then had to go underground.

"Not long ago asbestos was found under Black Lake. And what do they do? They send in an enormous dredge and suck out not only the water of the lake, but the mud, sand, and gravel that form its bed. All this they pump through a huge pipe to a hollow two miles beyond the west shore of the lake. And as if this were not enough, to prevent



National Film Board Photograph

Notice the fineness of the fibres of this piece of asbestos as it comes from the ground.

more water from getting into the lake, they send the water of the river across country in a new channel. Then to replace Black Lake, they build three dams to form three other lakes and to provide electricity for the mines. They move the highway, build bridges, — but there, I can't remember all they are doing. You should see it for yourself."

Part of the great open-pit mine at Asbestos. Notice the mill on the upper level.

Courtesy of Canadian National Railways



Maple syrup and sugar • Another leading industry of this region is the making of maple syrup. The Province of Quebec leads in the production of maple syrup, and most of it comes from the Townships. Eastern Townships syrup is usually considered the finest to be found. This is the story of the maple sugar industry as told by a farmer from Beauce County.

"My name is Jules Tessier. I own a large farm in Beauce County, not far from the Chaudière River. In the spring my chief business is making maple syrup and sugar. I have a large sugar bush, and often tap two thousand trees.

"Before the sap begins to run there is much work to be done. In winter I fill the big woodshed at the back of my sugar cabin. I choose good hard wood, maple or birch, that will give plenty of heat for the boiling. Then, as the snow begins to melt, I wash all my sap buckets and their covers, and make sure that my metal spouts are in good condition. Inside the cabin the big evaporating pans must be washed and placed in position,

and the fire box must be cleared of ashes and made ready for use. Then the sap tank has to be examined for leaks and thoroughly washed, and the collecting tank must be made ready to put on the sled. Some up-to-date sugar bushes now have long pipes that run here and there through the bush. The sap is poured directly from the sap buckets into these pipes and runs downhill into the tank at the back of the cabin. Some day I, too, shall have these pipes.

"At last the spring thaw begins, and I say to my good wife, 'Fernande, the spring is coming. I feel it in the air.' Soon the day comes when I can hitch my old *ponée* to the sled, take my snowshoes and my tools, and start for the bush. At the cabin I pick up a load of stacked sap buckets and the spouts. Back and forth through the bush I go. On the south side of each good sugar maple I bore a hole, and into it I hammer a spout. From the hook on the spout I hang a bucket and fasten the cover in place. How I love travelling back and forth through the snow in the woods in spring!

A maple sugar bush in Quebec.

Courtesy of Canadian National Railways



"When the trees are all tapped I listen carefully that night to the weather report on the radio: 'Cold tonight, but fine and warmer tomorrow.' 'Aha, Fernande,' I say, 'a fine day for the sap tomorrow.'

"The next day I take my two big boys and the hired man to the woods with me. One lays a big fire under the evaporating pan, and the rest of us take our sap yokes and gathering buckets and go off to the bush. The sap yoke on our shoulders is heavy, but with it we can each carry two pails and still have our hands free to empty the sap buckets into our pails as we pass from tree to tree. By noon there is enough sap in the storage tank to make 'a boiling,' and so we light the fire and turn the tap in the tank to let the sap run into the evaporator.

"Soon the cabin becomes warm. Clouds of steam rise from the evaporator and pass out through the opening in the roof. From time to time we place another log on the crackling fire. In the evaporator the sap is boiling, giving off the delicious smell that is as much a part of eastern Canada as the maple tree itself. The sap passes from the back of the evaporator through one section after another, boiling faster and faster as it nears the hottest part of the pan. It must be tested over and over with a special instrument until it is at the exact thickness required by law. Then it is drawn off into the syrup tins ready for sale.

"This first 'run of sap' makes the best syrup, and so is usually sold in this liquid form. Later on in the season the syrup is boiled down further, in a big pan, until it thickens enough to harden into sugar. At the proper time it is poured into tin moulds to form cakes. From Beauce County much of our syrup is shipped away in big drums to the United States. Much of it is used in the tobacco industry.

"Sometimes we have a 'sugaring off.' That is great fun. *Monsieur le curé* comes, and our



Service de Cine-Photographie, Province de Quebec

Boiling sap in an evaporator. Notice how carefully the man is watching his thermometer to tell when the syrup is thick enough to draw off.

friends and neighbours, as well as the children from the school. We put snow into pans and sap buckets. Then, as the company sits around on logs, we pass around, pouring out the hot syrup onto the snow. We call this syrup on snow *la tire*, and how good it tastes!"

THINGS TO DO • 1. Perhaps you would like to set up a model of an Eastern Townships sugar bush. You will need to find pictures to see how it looks, if you have never seen one. Why is maple sugar not made in northern Quebec?

2. Find as many reasons as you can why farming is carried on more easily in the Eastern Townships than in northern Quebec.

3. On a map of the world trace the journey of a bale of wool from Sydney, Australia, to Sherbrooke. It goes first to London by way of the Suez Canal, and then across the Atlantic Ocean to Canada and up the St. Lawrence River to Montreal.

The St. Lawrence Lowland Plain

A small but important region • Between the Laurentian Uplands and the Appalachian Region is the smallest, and yet the most important, region of the Province of Quebec.

If a great giant had pushed his fist into Quebec over the St. Lawrence Valley, and then carefully smoothed over the surface of the dent he had made, the result would not be unlike what we see. The plain is the shape of a triangle. The eastern corner is at Quebec, the western corner is at Hull, on the Ottawa River, and the southern corner is at the northern end of Lake Champlain, the source of the Richelieu River. After the ice sheet melted, this lowland was covered by an arm of the sea. The plain that we now see was the sea bottom. North of the plain lies the wall of the Laurentians. This is the name given to that part of the Laurentian Uplands north of Montreal. Southeast of the plain runs the base of the Appalachians. Find them on the diagram on page 79. Over these walls, or *escarpments*, tumble most of the rivers running into the St. Lawrence. Power from the falls has been used to develop electricity, and at the falls busy manufacturing towns have grown up. Electricity unused at the falls is carried by great power lines to towns and cities many miles away. Already we have in this plentiful power one reason why so many people live on this plain. Let us see what other reasons we can find.

When the French first came to Quebec, they settled on this plain along the St. Lawrence. There are still many remains of these early settlements. There are ribbon-like fields, old stone houses, and a few stone windmills. The farms are still producing well, and with care should continue to do so, because this is one of the finest farming regions in Canada.

Unlike most of the rest of the province, this plain has deep, rich soil, and the level land makes it easy to use farm machinery. The rainfall is heavier here than in most of Quebec, and the growing season is three or four weeks longer. In addition to all these advantages, right through this plain runs

the St. Lawrence River, bringing the ships of the world one thousand miles into the heart of the continent.

Above the level surface of the plain eight small volcanic hills, or "mountains" as they are usually called, rise steeply. Of these, Mount Royal, in the centre of the city of Montreal, is the best known. The outer layers of these old volcanoes have been worn away by rain, frost, snow, and moving ice: only the hard *cores* remain.

Although there are no minerals of great value in the St. Lawrence Lowland, building stone is common, and clay for bricks is found in several places. Near St. Johns is a kind of clay called *kaolin*, which is made into porcelain for bathtubs and basins. On the Island of Montreal is a kind of limestone used in making cement, and near the northern end of Lake Champlain is a fine grade of marble. All these *quarry products* provide materials for building roads, houses, factories, and public buildings.

Montreal • Almost at the centre of this plain, on an island in the St. Lawrence, is Montreal, the largest city in Canada. Since the greater part of the life of this plain depends upon Montreal, serving it and being served by it, we must learn something about the city and its needs.

Let us see if we can discover why Montreal has grown to be a city of over a million and a half people, larger than Quebec or Trois Rivières, which are older than it is. Look at the map on page 80 and the pictures on pages 52 and 83. We shall make a list of the reasons for the growth of this city, because they will help you to understand the growth of other cities.

1. First, Montreal is a port. This is true of Quebec and other cities along the river, but above Montreal are the Lachine Rapids. For many years these rapids prevented large ships from going farther up the river. This made Montreal the head of ocean naviga-



The St. Lawrence Valley, looking up river towards Lake Ontario from a point below Quebec City.

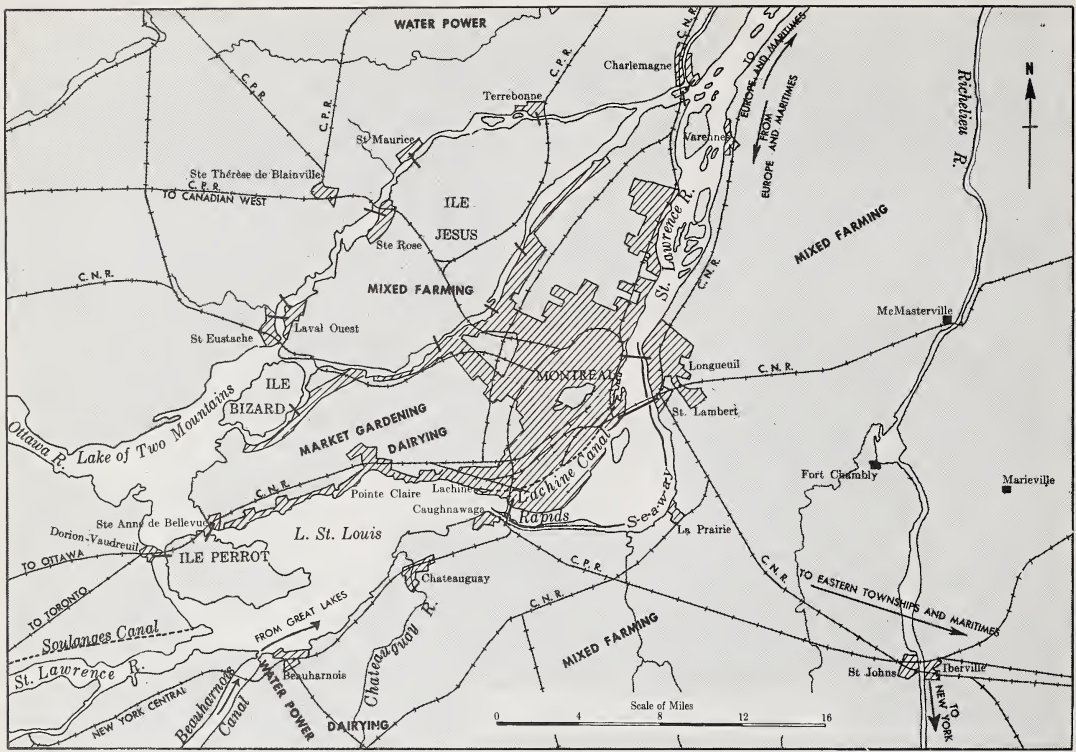
tion on the St. Lawrence. Large ships from overseas and smaller boats from up the river unloaded and exchanged their cargoes here. To care for these cargoes, Montreal has great grain elevators, a large cold storage plant, warehouses, and great cranes for lifting heavy cargo.

With the building of the St. Lawrence Seaway, ocean freighters can continue by canals on up the river and the Great Lakes. However, many ships still tie up at the wharves in Montreal, to unload passengers, raw materials and food for this great industrial city, and to take on cargoes of manufactured goods. These include meat, butter, cheese, flour, evaporated milk, medicines, machinery, electrical goods, lumber, newsprint, and dozens of other things.

Another result of the building of the St. Lawrence Seaway has been to develop the

south shore of the river opposite Montreal. This really means enlarging the Port of Montreal, and increasing the area where manufacturing is carried on.

2. Montreal is also the meeting place of two other river routes. From the northwest comes the Ottawa River, which joins the St. Lawrence at Montreal. See the map on page 80. Naturally, the lumber and dairy products from this valley come to Montreal. From the south flows the Richelieu River, shown on the maps on pages 72 and 198. If you follow this river southwards, you will come to Lake Champlain, in which the Richelieu has its source. The southern end of Lake Champlain is not far from the source of the Hudson River. Follow down the Hudson, and you reach New York, on the Atlantic Ocean. This valley of the Hudson and Richelieu is one of the most important trans-



A map of Montreal and the surrounding area.

portation routes in North America. Because of its importance, the first railway in Canada was built to connect Montreal with the Richelieu. Today, along this route, by train, by truck, and by barges in the summertime, goods are being carried back and forth between the largest city in Canada and the largest city in the United States.

3. Because Montreal lies at the centre of a fertile plain, it is certain of having a supply of many of the foods that it needs. In return, it sends out all sorts of manufactured goods to the small towns and villages round about.

4. Because the St. Lawrence runs past its doors, Montreal has plenty of water for all its needs. Some cities have to bring their drinking water in huge pipes for hundreds of miles, but Montreal is more fortunate.

5. Plenty of water power on all sides en-

courages manufacturing. Where coal is needed, it can be brought in easily by boat from Nova Scotia and from the United States. Oil comes in by tankers from South America and ports on the Great Lakes and by pipe lines from Portland in New England.

6. Lastly, there are plenty of workers for all the mills and factories, as the city attracts young people from the country round about.

For all these reasons, it is easy to see why Montreal has grown to be such a large city. There is one great drawback to its growth, however. For nearly four months during the winter the river freezes over, boats cannot reach the harbour, and the port is closed. Goods from western Canada must then pass out through the ports of Halifax in Nova Scotia, Saint John in New Brunswick, or Portland and New York in the United States.

Work done in the city. Now how do you think the people who live in Montreal make a living? Make a list of the industries that you might expect to find in Montreal, and then check your list with the following paragraphs.

The wheat brought in from the West is made into flour, and some of the flour is made into bread. Iron that comes chiefly from the United States is made into all kinds of things, from tacks to locomotives. Copper from the mines of Noranda is refined and then made into wire and different kinds of electrical equipment for the many power plants. Oil and sugar from abroad are refined, as they are in Halifax. Some of the sugar goes to candy factories. Clay and limestone, found on the island, are made into cement, which is so much used for buildings, dams, and roads. The many people round about must be clothed, and so there are woollen, cotton, and silk mills, and factories that make men's and women's

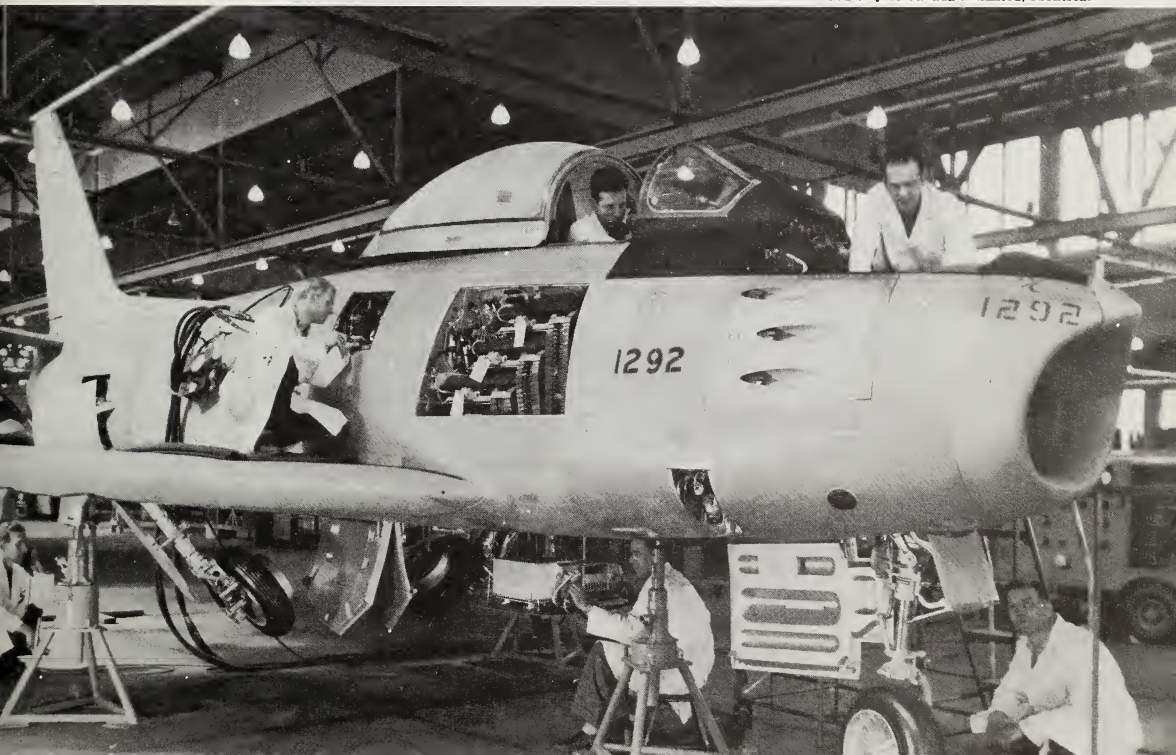
clothing, boots and shoes, hats, and furs. Many workers are busy building ships and aeroplanes, and most of the cigarettes and other tobacco products made in Canada are produced in Montreal.

Montreal is a centre of education and business, as well as a manufacturing city. There are two universities, one French and one English, and many colleges. The head offices of the chief railway companies, banks, insurance companies, and lumber companies are also located here.

Feeding a city. The level, fertile plain round about Montreal is used chiefly to raise food to feed the city dwellers. Near the city, where the land is the most valuable, the farms are used to raise vegetables and small fruits such as strawberries, raspberries, currants, and gooseberries. This kind of farming is called *truck farming* or *market gardening*. Apples too are a common crop. The best known apple-growing districts

Finishing the work on a jet plane in a Montreal factory.

Courtesy of Canadair Limited, Montreal



are on the lower slopes of several of the old volcanic peaks of which you read on page 78. Along the northern border of the plain, tobacco growing is becoming important. Flax, from which linen is made, and sugar beets are also grown on the plain.

Not far from the city we find dairy farms. The St. Lawrence Plain is one of the chief hay-producing regions in Canada, owing to the heavy clay soil and plentiful rainfall. In many places bees are kept. These gather honey, chiefly from clover and buckwheat blossoms. Still farther away from the city, mixed farming is common. The chief crops, in addition to hay, are oats, buckwheat, corn, and root crops such as potatoes and turnips. Poultry and pigs are kept, and the eggs and meat are sold in the city. Many small canning factories use some of the fruit and vegetables, and cheese and butter factories use much of the milk and cream.

The textile industry. In many parts of the plain, manufacturing of several kinds is carried on. The two commonest kinds are the making of textiles and the manufacture of various kinds of paper. Let us see what a worker in a cotton mill has to say.

"My name is Nora Murphy. I work in a big cotton mill in Montreal, along with my mother and my sister Rose. My father works nights for the railway, and my older brother

works at Lachine for a company making steelwork. Lachine is a large city on the St. Lawrence just southwest of Montreal.

"When I first went to work I thought it was exciting going to the big mill, seeing so many people, and having my own money to spend. Now I am often tired of doing the same thing day after day and of listening to the noise of the *looms* that weave the cotton.

"But you want to hear about my work. I work in the weaving room where the thread is woven into cloth. There are rows of looms the whole length of the huge room. We girls go from one loom to another, seeing that everything is working properly, and changing the *bobbins* and *spindles* when they are empty. The spindles are spools which carry the thread of the *warp*. These warp threads are drawn side by side onto a roller a yard wide, and run the length of the cloth. The bobbins are spools which carry the *woof* threads that run back and forth, in and out, across the cloth.

"Perhaps you would like to know what happens before and after the weaving process.

"The raw cotton is grown in the southern United States, where the summers are longer and hotter than they are here. After the seeds have been removed from the fluffy white *bolls* on the plants, the cotton is pressed into bales, each weighing 500 pounds.

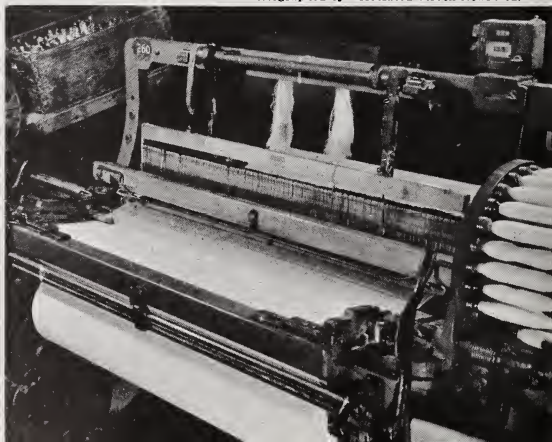
Opening a bale of cotton in a cotton mill. The bale is bound with a number of metal bands.

Photographed by Associated Screen News Ltd.



A cotton loom. Find the bobbins and the warp and woof threads.

Photographed by Associated Screen News Ltd.



Part of the harbour
of Montreal. Find
the following:
docks, grain elevators,
coal piles, and
warehouses.
To the left are
the two final locks
of the Lachine Canal.



The bales are covered with sacking and bound around with metal bands. Their journey north to Montreal may be first by boat on the Mississippi, and then by train to the border between Canada and the United States. There the bales are fumigated to kill any harmful insects that might enter Canada on the cotton.

"When the bales reach our mill they are unwrapped and the cotton is fluffed up until it is about twice the size of the bale. Then it is cleaned of any remaining seeds and twigs. This fluffing and cleaning is repeated several times before the cotton goes to the *carding* rooms. There it is teased, or combed, over and over again to straighten out the

tiny fibres. The finer the cotton goods to be made, the oftener the carding must be repeated. At last the cotton is ready for spinning, or twisting into thread. From the spinning rooms the thread on the big spools and bobbins comes to us for weaving.

"Even after the cotton leaves us as cloth, it is not ready for sale. It must be dyed, or printed in patterns, and then starched and pressed. You did not realize, did you, how many people had handled and worked over the material in your dresses and shirts! Sometime perhaps you will visit a cotton mill. When you do, I am sure that you will be surprised at all the buzzing, whirring, clanking machinery that you will find."

WHY MAPS OF THE SAME PLACE SOMETIMES LOOK DIFFERENT

You may have noticed that Montreal is shown on several maps, but that it does not always look the same. Look at the map of Canada on pages 6-7. The city is shown by an irregular dot, and around the dot is a tiny outline of the Island of Montreal. Now look at the map on pages 58-59. Here the island is larger, or seems to be. On the map on page 80, we see the same thing *magnified*, or enlarged, still more. Here we see not one island but several, and the city of

Montreal is no longer a dot but a shaded area which shows its size. Lastly, on this page is a map of the streets of a small part of the city.

What is the reason for these differences? The answer is that there is a difference in *scale*. On a strip of folded paper carefully mark off an inch. Now turn back to each of the maps which you have used and lay the marked paper along the scale of miles. On the first map, one inch stands for 300 miles; on the second it stands for 80 miles; on the third it stands for 8 miles; and on the last it stands for $\frac{2}{5}$ of a mile.

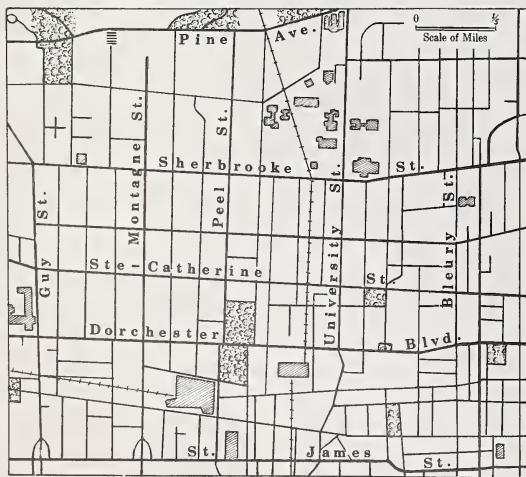
From this we learn that the smaller the number of miles to the inch, the smaller the area covered by the map, and the greater the amount of detail that can be shown. Maps like the last two are spoken of as *large scale maps*, because each mile on the ground covers a fair amount of space on the map. The first two maps are *small scale maps*, because a mile on the ground is so small that it can scarcely be seen on the map.

Quebec • At the eastern end of the St. Lawrence Lowland Plain stands Quebec. It is a beautiful city, the second largest in the province, and the only walled city in North America. Part of the city is built on cliffs high above the river, and crowning these cliffs is the citadel, or fort. At the foot of the cliffs, along the river and its tributary, the St. Charles, is Lower Town. Here the streets are narrow, and many of the buildings are very old.

Since Quebec is the capital of the province, we find the Parliament Buildings there. The city also has a great university, and many churches whose bells are forever ringing. Its harbour is large and so deep that the biggest ships can enter easily. Near Wolfe's Cove there are docks for passenger liners. Quebec has grain elevators and large pulp mills, boot and shoe factories, and iron works.

SOMETHING TO THINK ABOUT • What is the chief raw material used in each of Quebec's industries? Can you tell where each of these raw products may come from?

Part of central Montreal





Courtesy of Canadian National Railways

Part of Quebec's Upper Town. Beyond the St. Lawrence River we see the rim of the Laurentian Upland to the left, the Island of Orleans in the centre, and a part of the city of Lévis across the river to the right.

The Quebec district. On the map on pages 58-59, notice how Quebec is located where the St. Lawrence begins to widen to form its *estuary*. Quebec is the first port of importance on the river. Across the river are large ship-building yards. At the foot of the falls near the mouth of the Montmorency River are large cotton mills.

Market gardens. Near Quebec are market gardens which supply the people of the city with fresh vegetables and fruits. On many of these farms modern machinery is used, but on some the work is done mostly by hand, as it has been done for centuries. Suppose we visit one of these farms on the Island of Orleans. Madame Laframboise is glad to tell us of life on the farm where she lives. Here is her story.

"I live with my husband and children on the Island of Orleans in the St. Lawrence River, not far from Quebec. My husband's people have lived on this farm for more than two hundred years. Not long ago a man from the city wanted to buy our farm to build a summer hotel. Not for a minute would my husband think of selling his land!

"Our farm is not large, like those in the

Eastern Townships, but we always have much work to do. We raise vegetables and small fruits for the market in Quebec. We keep a horse, a few cows, a pig or two, and some chickens. To feed them we grow hay, oats, and turnips. But most of the land is used for our market crops.

"Market gardening is hard work. Long before the snow has melted we start many of our seedlings in hot beds and cold frames. As soon as the ground is dry enough after the snow has gone, my husband and my older sons spade in the fertilizer that was placed on the land after the fall ploughing. To keep our land in good condition we must keep it well fertilized, and my husband always tries to learn the best way to do this.

"When the land is ready, we plant potatoes, and put in seeds of vegetables such as carrots, beets, peas, and beans. When the earth warms up and there is less danger of frost, we set out our seedlings: lettuce first, then cabbages, cauliflowers, and last of all, when it seems safe, tomatoes, green peppers, and cucumbers. Setting out the little plants is back-breaking work, which must be done when the earth is moist and the sun is not too hot. Even with all our care, a late frost



G. A. Driscoll, A.R.P.S., Quebec, P.Q.

Madame Laframboise in her fields overlooking the St. Lawrence River.

may come along and kill all the young plants that we have worked so hard to grow and set out.

"Do not think that our work is finished when the seeds and plants are in the ground. Indeed, no! Sometimes I think it has just begun. From that time until the crops are

Picking strawberries on the Laframboise farm.

Provincial Publicity Bureau, Quebec — Photo Driscoll



ready for market, we fight a battle against weeds that would choke out our little plants, and against all sorts of insects and diseases that would destroy our crop. We hoe, we water, we spray; and then we hoe, we water, and we spray some more. The work is never done.

"But the vegetables are not the only things to think of. We have our fruits as well — strawberries, raspberries, currants, gooseberries, and a few apple and plum trees. A new strawberry bed must be made every year, by setting out plants. The fruit trees and bushes must be sprayed and pruned, or thinned out, at the proper time.

"When the time comes to take our produce to market, there is the work of picking the berries and fruit as they ripen, and pulling the vegetables, cleaning them, and tying them in bunches ready to sell. We often work very late at night to finish this, so that everything may be as fresh as possible when it reaches town. On market days we get up very early to start our trip to town. Even so, it is much easier now that my husband owns a truck, which he can drive across the bridge that joins the island to the mainland. In the old days, when we had to go in a wagon and take a ferry from the island to the mainland, it was very tiresome.

"As soon as we reach the Champlain Market in Quebec, we go to the stall that we rent, and arrange our vegetables and fruits to look as well as possible. Soon our customers arrive, and we are busy selling. Often someone says to me, 'Ah, Madame, what fine carrots these are, so smooth, so clean!' or, 'What big gooseberries! I never saw anything like them!' Then I am happy, and I forget how my back ached while I was picking them.

"In the winter we have not, of course, so much to do. There are still the animals to care for and the housework to do, but I have time to make hooked rugs to sell to the tour-

ists in the summertime. It is a busy life, oh yes, but I would not change to live in the city, no, never!"

Other cities • The St. Lawrence Plain has many other growing cities. Trois Rivières, at the mouth of the St. Maurice, is an important port and has huge paper mills and textile plants. Sorel, at the mouth of the Richelieu, has ship-building yards, iron and steel works, and a metal refinery. Turn back to page 69 if you do not remember what metal is produced. Hull, on the Ottawa, has pulp and paper mills and a match factory. Valleyfield, not far from the great Beauharnois hydro-electric power plant, has textile mills, a chemical plant, and metal works. St. Hyacinthe, on the Yamaska, has plants where textiles, clothing, and farm machinery are made. It also has a plant making organs which are shipped to many countries. Try to think of reasons why these industries are well placed. Try also to find out something about the industries of Granby, Drummondville, and Joliette, all cities of the plain.

THINGS TO DO • 1. Plan an exhibit for the Province of Quebec at a world's fair. In doing so, decide first what are the interesting or important things about the province that you would want the rest of the world to see, and second, how best you can show these.

2. Draw a large map of the Province of Quebec. On it show the St. Lawrence River and its six most important tributaries. Print in the names of six important cities. In red crayon print in the words *dairying*, *market gardening*, *lumbering*, and *fishing* where these industries are carried on.

3. In your notebook make a list of those cities and towns of Quebec where pulp, or pulp and paper, are manufactured. Opposite the name of each place write the name of the river on which it is located. Use your book and your map. Try to find a reason for building each mill where it is located.

4. Do the same for the textile plants.

5. In what ways does Quebec stand first

among the provinces of Canada? Reread the chapter to find out.

6. Give as many reasons as you can why:

a. The Province of Quebec as a whole has a small population for its size.

b. Most of the people of Quebec live in the St. Lawrence Lowland.

c. Hay is an important crop in the St. Lawrence Lowland.

d. Lumbering is not an important industry in the St. Lawrence Lowland.

e. Mining is not an industry of the St. Lawrence Lowland.

7. Debate with your classmates this topic: Resolved that it is better to live on a farm in the Eastern Townships than in the city of Montreal.

8. Now that you have read several stories of life in the Province of Quebec, you will see what a variety there is. Nora Murphy would not be at all at home if she had to work in Madame Laframboise's garden. Neither would Jules Tessier know what to do if he were to find himself in the paper mill with Lars Larsen. It takes a great many people doing many different kinds of work to make the business of any country run smoothly.

Of course there are many, many other workers in Quebec of whom you have not heard, and others who are doing the same kind of work but in a different way. Perhaps your father, or your big brother or sister, is doing a kind of work not described in this chapter. Find out at home what it is and how it is done, and tell the class about it. Is that kind of work done in Quebec?

9. Gold mining is an important industry in northern Quebec. Try to find out how the work is done and write a story about it as it might be told by one of the miners.

EXTRA READING • Some books to tell you more about the Province of Quebec.

Canadian Neighbours, by HARRY E. AMOS
(Ryerson Press)

The Story of Pulp and Paper in Canada, by W.
STUART MACFARLANE (Copp Clark)

Our Story of Travel and Transport, by J. M.
SCOTT (Copp Clark)

Logging in Canada. A set of pictures. (Queen's
Printer, Ottawa)

IV • North of The Great Lakes



Toronto Harbour Commission

A view of Toronto from the harbour.

THE PROVINCE OF ONTARIO

THE EARLY HISTORY

The first explorers • West of Quebec lies Ontario. This province was settled much later than Quebec. Etienne Brulé first explored the region around the Great Lakes and was followed by Champlain in 1615. On the map on pages 104-105, trace Champlain's course from Montreal up the Ottawa River and its tributary, the Mattawa, across the portage to Lake Nipissing, and down the French River to Georgian Bay. A monument now marks the spot where he first saw Georgian Bay.

The rough country which Champlain crossed after leaving the Ottawa Valley is a part of the Laurentian Upland. This region of rocks, lakes, and forest covers most of northern Ontario, just as it does northern Quebec. Look at the map on page 13 to find what other physical region occupies the southern part of Ontario north of Lake Erie and Lake Ontario.

To reach the Great Lakes, Champlain followed the Ottawa River, not the St. Lawrence. This was because, at that time, the many falls and rapids of the St. Lawrence made it impossible to paddle up the river. This is one reason why the French never really settled Ontario. Even when the English conquered Canada, there were only a few French forts along the Great Lakes. Of these, Fort Frontenac, where Kingston now stands, was the oldest.

The settlers • When the United States became an independent country, many Loyalists left their homes there and settled along the upper St. Lawrence and the Great Lakes, as others did in the Maritimes. When John Graves Simcoe became the first Governor of Upper Canada, as Ontario was then called, he invited other settlers from the United States to come to Canada. Later, people from England, Scotland, and Ireland, as well as some Germans from the United States, made homes for themselves, chiefly in

the southern part of the province. There, better soil and a growing season longer than in other parts of the province promised a good opportunity for farming.

At first, most of the new settlers were busy with farming and lumbering. Later, as more of the country's natural wealth was discovered, and as the means of transportation improved, the southern part of Ontario developed into a most important manufacturing region.

Canals and railways • The improvements in transportation began over a hundred years ago. We have already seen how falls and rapids prevented Champlain from travelling up the St. Lawrence. The first improvement in transportation was the building of canals to get around the rapids which lay between Montreal and the Great Lakes. Soon railways also were built, because trains could travel faster than boats and could carry goods in the winter when the canals were frozen. But the waterway is more important in some ways than the railways. In fact, the route formed by the St. Lawrence and the Great Lakes is of such importance to Ontario that we shall take a trip from Montreal to the head of the lakes at Fort William. In this way, we can see for ourselves why Ontario, which has a smaller area than the Province of Quebec, is the home of one-third of the people of Canada. On our trip we shall follow the route of the St. Lawrence Seaway. As you read, follow it on the map on pages 92-93.

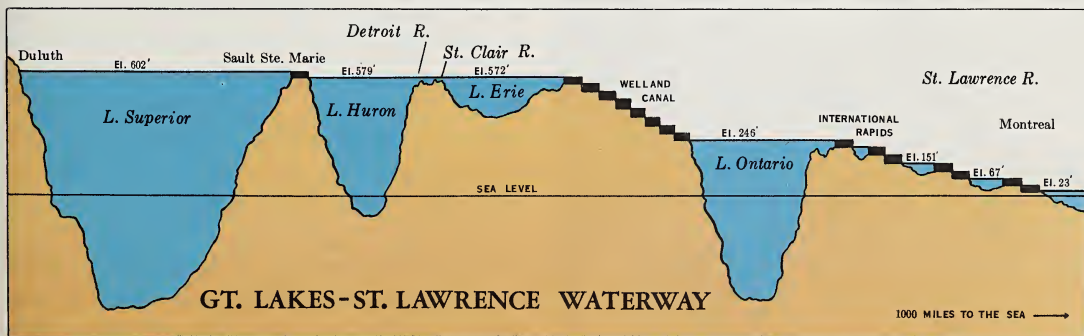
A TRIP UP THE SEAWAY From Montreal to Toronto

We are off! At Montreal, we take a bus across one of the bridges over the St. Lawrence to reach the south shore of the river, where we board our boat. The docks here are really part of the harbour of Montreal, although they are located across the river from the main harbour. This part of the harbour is quite new and was built to handle traffic going in and out of the first canal of the Seaway.

The whistle blows, the gangplank is pulled in, and our vessel is on its way. In a few minutes, we pass under the high bridge that carried us from Montreal to the mainland. Why must the bridge be so far above our heads? After passing under it, we enter the first canal on our journey.

Canals and locks • The early canals around the rapids in the St. Lawrence were small, and until the Seaway was built, large ships could not sail farther up the river than Montreal. They had to stop there, and their cargoes were transferred to smaller boats. This, as you will remember, was one of the reasons why Montreal became such a large port. Now, however, large ships no longer have to transfer their cargoes. The new canal which we are entering is the beginning of a deep, wide channel that can carry great ships up to the lakes.

This first canal will take us around the Lachine rapids, whose water is travelling



downhill to the Atlantic. Since we are going west, toward the centre of the continent, we are really travelling uphill in our ship. Study the diagram on page 89. This shows you that our trip to the Great Lakes is like a journey up a giant staircase. The figures tell us how many feet above sea level the parts of the staircase are. How far are we above sea level at Montreal? How many feet shall we rise when we go up the first section of the staircase?

A step in the water staircase is called a *lock*. Ships sailing upstream climb the step or lock; ships going downstream, toward the ocean, go down the step.

At each end of the lock are strong doors or gates, made of steel and wood. As our ship sails into the lock, through the open lower gates, we see that the upper gates are closed. After we are inside the lock, the lower gates are closed behind us. Then more water is let into the lock, until the level of the water is the same as on the "upstairs" side of the

These three locks in the Welland Canal look like giant steps. Notice that all the lock gates are closed.

Department of Transport, Welland Canals



closed gates ahead of us. As the water rises, our ship rises too, until the upper deck is higher than the top of the wall.

We have now gone up the first step of the staircase. The upper gates are opened and we sail out of this lock and on to the next one. Study the picture on this page and explain how a boat would be "locked through" going downstream.

To Beauharnois • We leave the first Seaway canal and cross Lake St. Louis, which is formed where the Ottawa River enters the St. Lawrence. Through this lake is a channel twenty-seven feet deep. At the western end of the lake we enter the Beauharnois Canal. As we sail into the first lock of this canal, we notice a very long, fairly low building. It has many power lines leading from it, carried by great steel towers. This is the Beauharnois power house. The building is more than half a mile long and is one of the largest producers of hydro-electric power in the world. Much of Montreal's power comes from Beauharnois.

After passing through a second lock, we find ourselves in a very wide canal. This canal carries water to the power house we have just seen. The rapid waters of the St. Lawrence force man to build expensive canals, but they also help him by producing electricity to make the goods he needs.

On to Cornwall • After leaving the Beauharnois Canal, we enter Lake St. Francis. Study the diagram on page 89. How many feet above sea level are we now? Our ship is sailing between flat, green fields. This section of Ontario is part of the St. Lawrence Lowland. Presently we come to Cornwall. This is a busy town with large paper, cotton, and rayon mills. Freight for these mills can come by boat, as there are docks close by.

The International Rapids Section • At Cornwall, we reach the most important part of the St. Lawrence Seaway. This section is called the International Rapids Section. It was given this name because the boundary

*In the Thousand
Islands. The Ivy Lea
Bridge, joining
Canada with the
United States.*



Canadian Government Travel Bureau

between Canada and the United States runs along the middle of the river.

For a distance of fifty miles, stretches of roaring rapids used to interrupt the quiet flow of the river. Canals and locks allowed ships to pass by these rapids. Only small boats could use this part of the waterway, however, because these canals were only fourteen feet deep. When the plans were made for the St. Lawrence Seaway, it was decided to “drown” these rapids. That sounds strange, you will think, but that is what actually happened.

First, a *control dam* was built across the river above the rapids. This dam controls the level of the water in the area that was later to be “drowned.” Below the rapids, the main dam was built, as well as a power house. The water was allowed to gather — and to rise — behind the main dam. As the water rose, the rapids slowly disappeared. Where they used to be, a lake grew in their place, drowning not only the rapids but roads, a stretch of railway, houses, and even the site of a whole town!

While all this was happening, a canal and locks, twenty-seven feet deep, were built on the American side of the river. By means of these, ships using the Seaway can be lifted

from the level of the river below the dam to the level of the man-made lake above the dam. Ships headed downstream, on the other hand, are dropped by means of the locks from the level of the lake to that of the river.

As we travel westward from Cornwall, we enter the first lock in this section of the Seaway. Overhead we notice many power lines. On both sides of the river we see the giant steel towers that carry these lines far across the countryside. These towers are very high — higher than most skyscrapers in our Canadian cities. To our right, almost hidden by an island, is a power house even larger than the one at Beauharnois. It is a remarkable power house, since half of it belongs to Canada and half to the United States. The international boundary line passes through the middle of the building. Here, the water of the river is being used to provide power for the industries of both Ontario and New York State. This power is bringing many industries and many people to the area.

As we pass through the International Rapids Section, locks raise us to the level of Lake Ontario. Soon we are on the Canadian side of the river again. On the bank is New Iroquois. It was built to replace the old town of Iroquois which went under water when

the artificial lake was made. Houses, stores, and other buildings of the old town were taken to the new location by huge machines. So skilfully was this done that the people in the houses didn't even have to take the pictures off the walls! With its new streets, some new stores and houses, and many new industries using cheap electric power, New Iroquois is a busy place.

We pass through the last lock of the International Rapids Section and sail on from New Iroquois to Prescott. The river is very busy here, with many boats passing up and down. We see long freighters carrying iron ore upstream. This ore comes from the Quebec-Labrador area. Lumber is also being carried up-stream, while grain and coal are two important cargoes going downstream.

Through the Thousand Islands · Before reaching Kingston, we sail through a very beautiful

stretch of the river among the Thousand Islands. Many of these islands are very small, but most are large enough for fine summer homes. As our ship makes its way along the channel, we notice the blackish masses of rock that form the islands. The same kind of bare rock may be seen jutting out here and there on both sides of the river. Between the rock masses are clumps of hardy evergreens growing in shallow soil. The map on page 192 shows that at this point the Laurentian Upland extends southward into the United States, forming what are known as the Adirondack Mountains.

Kingston · Presently our boat docks at Kingston, an old and interesting city which was once the capital of Canada. Kingston grew rapidly in the early days because of its position at the outlet of Lake Ontario. Today it is usually thought of as a "college



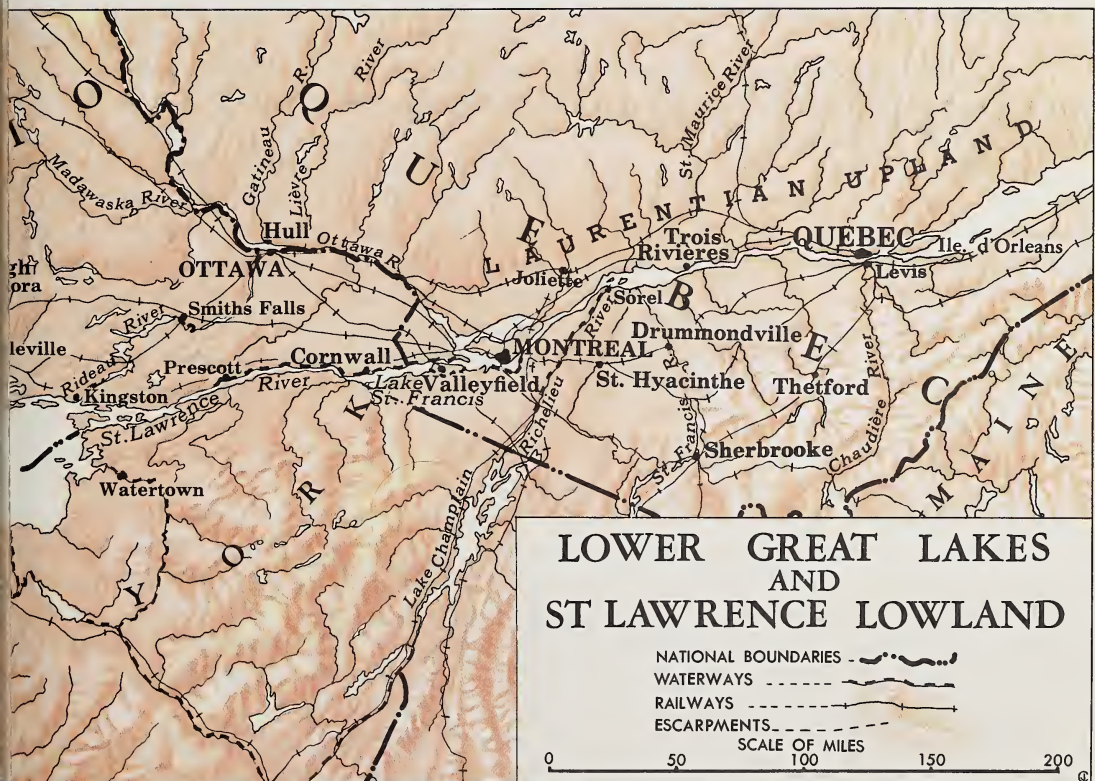
town,” since Queen’s University and the Royal Military College are located there. It has important industries, too. One is the making of aluminum articles. Ships carry the aluminum along the Seaway from the Saguenay area which you read about on page 66. Kingston has yards where ships are built and repaired. Locomotives, mining equipment, and nylon goods are also made.

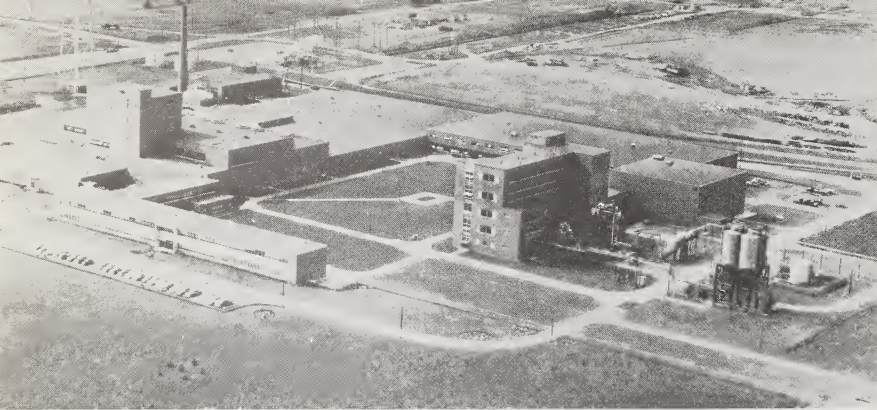
Lake Ontario • Shortly after leaving Kingston, we come out on to the wide stretch of Lake Ontario. Look at the diagram on page 89. How many feet have we risen in travelling two hundred miles from Montreal? We have climbed a good part of the water staircase. Our journey has taken us a long way upstream. Maybe you can understand why Ontario used to be called “Upper Canada” and why Montreal, which is far below us, was in “Lower Canada,” as Quebec was called.

So large is Lake Ontario that it is easy to imagine we are at sea, although at least one shore is usually in sight. All along the way we see ships of many kinds. We are told that, although we are travelling along the *Seaway*, many of the vessels that we pass never see the ocean. Some are ocean vessels, of course, but most are large lake freighters.

The lake freighters are long and low, except at the bow and stern. The engines are at the stern of the boat, and the bridge, from which the boat is steered, is at the bow. The low central part makes the boat somewhat weak. However, such a vessel is well suited for navigating the lakes and canals of the St. Lawrence Seaway, although it might not be strong enough to brave the storms of the open ocean.

The low central part of a freighter has many *hatches*, or covered openings. When the





**A Terylene plant
not far
from Kingston.**

Canadian Industries Limited

boat comes alongside a dock, all the hatches are opened, and grain or other cargo can be loaded into many of the openings at once. The largest of these vessels can carry as much grain as a freight train four miles long! Since the Seaway is closed by ice for at least four months in the year, the ships are always hurrying, loading and unloading as quickly as possible.

We reach Toronto just about sunset and have a beautiful view of the tall buildings of the city against the glowing sky.

THINGS TO DO • 1. The part of the St. Lawrence Seaway between Cornwall and Prescott was the most difficult to build. Can you find some reasons for this?

2. Visit your school or town library and ask for information about the building of the Seaway. Old magazines and newspapers from 1950 on may contain information. The 1954 and 1955 issues of the magazine *The Beaver* will help you. Report to your class on what you find out.

From Toronto to Fort William

On our way again • To make the rest of our trip up the lakes, we take another passenger ship from Toronto. We intend to return later to take a longer look at Canada's second largest city. As we leave, we notice how busy the port is. Toronto is becoming an important port, able to handle large ocean freighters as well as lake boats.

Our ship crosses Lake Ontario, heading

for the entrance to the Welland Canal. Maps show us that Lake Ontario and Lake Erie are linked together by the Niagara River. However, Niagara Falls make it impossible for ships to sail the length of the river.

Through the Welland Canal • The locks of the Welland Canal take us up more steps of the staircase. In fact, this is the greatest rise since leaving Montreal. Soon we are at Port Colborne, where we wait for a short time before sailing into Lake Erie.

Here, through a cloud of smoke, we get glimpses of freighters entering or leaving the canal. Ahead are three grimy coal carriers from the port of Erie on the southern shore of the lake. They are bringing United States coal to Canadian cities. Beyond them is a grain boat bringing wheat from Port Arthur.

On one side of us is another large lake boat carrying iron from Duluth to Hamilton. Duluth is a famous iron-ore port in the United States. Can you locate it on the map of iron-ore shipping routes on page 95? The arrows on the map show that iron comes to this "lower lakes" area not only from the west but also from the east. What region, belonging to the provinces of Quebec and Newfoundland, sends iron ore to this area? Most of this ore goes to ports on the United States side of Lake Erie.

Lake Erie and the Detroit River • At last we sail into Lake Erie. Many boats are passing,



Steel works at Sault Ste. Marie. Iron-ore carriers are unloading their cargo. In the foreground are piles of limestone and iron ore.

“Soo” canals are the busiest waterway in the world. Grain from the Canadian prairies and iron ore from the western end of Lake Superior are the most important cargoes carried.

On each side of the St. Mary’s River is a city of Sault Ste. Marie — one in Canada and one in the United States. The Canadian city has pulp and paper mills and important steel works. Most of the iron ore used here comes from Duluth and other ports on the southern shore of Lake Superior. Some comes from nearby iron mines of Ontario. The coal, which, as you know, is needed in the manufacture of steel, comes by water from the American coal fields south of Lake Erie.

Steel is made here at Sault Ste. Marie where coal and iron ore meet. The heavy bars and sheets of steel are usually shipped out on freighters.

Lake Superior • Now we are out on Lake Superior, the largest fresh-water lake in the world. When a strong wind blows, waves as high as those on the ocean make sailing difficult. The lake is almost two thousand miles from the open sea. We have climbed up through so many locks that we are now more than five hundred feet higher than Montreal.

The “Twin Cities” • At last we arrive at Fort William, the end of the Canadian inland waterway, on the northwestern shore of Lake Superior. Fort William and nearby Port

Arthur are often known as the "Twin Cities." Here, as at Halifax, Saint John, and Montreal, there are big grain elevators. The grain coming from the prairies by train is stored until it can be shipped to the east by boat. Sometimes it has to be stored all winter while the lakes are frozen over. The Seaway has made the shipment of this grain cheaper because large freighters can carry it all the way to Montreal, or even across the ocean to Europe, without transferring it to smaller boats at any time.

Some of the grain is made into flour at the "Twin Cities." Some of the flour is used in this part of Ontario, and some is shipped to the east. These cities also have pulp and paper mills which use lumber from the northern woods and power from the swiftly-

moving rivers. There are shipbuilding yards too, which provide new ships to carry grain, flour, and paper. At Port Arthur are docks where the iron ore from Steep Rock mine is loaded onto ships. Locate this important area on the map on page 95. The mine was made by pumping the water out of Steep Rock Lake. The ore is easily removed from the bottom of the old lake.

THINGS TO DO • 1. Now that you have completed your trip along the great waterway that forms the southern boundary of Ontario, make a list of all the reasons you can think of why this waterway is very important to Canada.

2. What products have become cheaper or easier to move as a result of building the Seaway? Why? Besides cheaper transportation, what

The Lakehead at Port Arthur. Notice the many huge grain elevators, the black and red ore-dumping docks, the lake freighters, the strings of box cars, and the pulpwood booms.





Canadian Pacific Railway Photograph

A lake freighter loading grain at the Lakehead.
Notice the many hatches.

has been one other great advantage the Seaway has brought to Ontario?

3. Perhaps you would like to find out how this same water route was used by the early settlers. The following books tell much about how they lived and travelled: *Pioneer Days in Ontario* by Henry Paterson, and *Finding New Homes in Canada*, by E.C. Guillet.

FARMING IN ONTARIO

Farming in the early days • Farming is the oldest industry of the southern part of the province. However, the kind of farming carried on today is very different from the kind carried on by the early settlers. In the old days each farm had to produce nearly everything used by the pioneer family. Furniture, tools, shoes, harness, and even candles were a few of the things that the family had to make themselves. The chief *cash crop* was wheat. (A “cash crop” is one which a farmer can sell for cash. The money, in turn, can be used to buy goods which he cannot produce himself.) Later, when the Prairie Provinces began to produce wheat more cheaply, the grain lands of Ontario were used to develop a great cattle industry. Today, large numbers of hogs and sheep are found in addition to cattle.



Courtesy of Canadian National Railways

Open-pit mining of iron ore at Steep Rock,
west of Lake Superior.

Mixed farming • Southern Ontario is one of the most important mixed farming areas of Canada. No other province produces so many different crops. These include tobacco, sugar beets, corn, vegetables, and many different kinds of fruit. Yet Southern Ontario is quite small and has much less farmland than Saskatchewan.

In certain sections, special crops are grown because the right climate and the right soil are found together. Thus one district *specializes* in tobacco, which is the local cash crop. Each farmer grows many other things besides his cash crop. If he specializes in tobacco, for example, only one-quarter of his land may have tobacco growing on it. The rest may produce other crops and livestock may also be kept.

The eastern lowlands • Look at the map on pages 104-105. Beginning at the eastern border of the province, find the plain along the Ottawa and the St. Lawrence. This is a part of the St. Lawrence Lowland, and, as we would expect, we find the same types of farming as in the lowlands of Quebec — mixed farming, dairying, and market gardening. Products of this region are sold in Montreal and Ottawa. Most of the famous

Canadian cheddar cheese comes from here and is shipped to all parts of Canada, as well as overseas.

The Lake Ontario plain • The next plain we find lies north of Lake Ontario. Here, as in most of Southern Ontario, mixed farming is carried on. There is dairying too, especially near the cities, and many apples are grown. Near the western end of this plain, market gardening becomes more important, and small fruits and vegetables such as peas, beans, tomatoes, and green corn are raised for canning. This region serves the Toronto area.

Just north of Toronto is Holland Marsh, one of the leading market-gardening areas of Ontario. Some years ago the marsh was drained and celery, onions, carrots, and potatoes are now grown here. These crops are shipped by truck to Toronto and by refrigerated railway cars to other parts of Canada.

The Niagara Peninsula • Rounding the western end of Lake Ontario, we come to one of the most important fruit regions in Canada — the Niagara fruit belt. The fruit is grown on



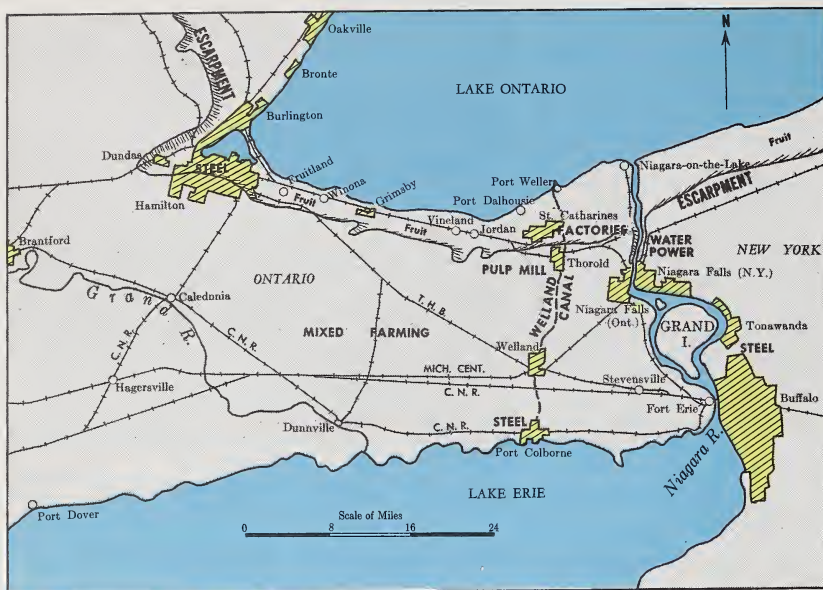
National Film Board Photograph

Onions from Holland Marsh being unloaded for shipment by railway.

a very narrow plain between Lake Ontario and a ridge of high land known as the *Niagara escarpment*. (It is over this escarpment that the water of the Niagara River tumbles to form the falls.) The escarpment serves as a windbreak, and the large water area of Lake Ontario helps to prevent frosts both in the

Farms on the Lake Ontario plain. From a study of the picture can you tell what any of the crops are?





A map of the
Niagara Peninsula.

late spring and in the early fall. This gives the fruit a longer time to ripen. The growing season here is seven months, one of the longest in Canada.

Peaches and grapes are the chief fruits grown in the Niagara district, but there are others — pears, plums, cherries, raspberries, and strawberries. Particularly during the picking season this is a very busy place; crowds of students and other young men and women from the cities come in to help pick, sort, and pack the fruit.

During the last few years many farms on the Niagara Peninsula have been sold because the land is wanted for factories and houses. The St. Lawrence Seaway has helped to bring new factories and industries to the area, and farmers have found that they can get more money by selling their land for factory sites than they could earn in many years of growing fruit. Study the map above. Why is this part of Ontario such a good place for factories? It will be a very bad thing for Canada in many ways if all the Niagara fruit lands disappear. No other part

of our country is so well suited to growing such a variety of fruits.

North of Lake Erie • There is another excellent and much larger farming region north of Lake Erie. Because this section of the province is the most southerly part of Canada, it has longer, warmer summers and shorter, less severe winters than does the rest of eastern Canada. The large lakes close by help to make the climate milder by warming the air in winter and cooling it in summer. There is enough rain here for certain crops; and farmers study the soil, learn about the local weather, and decide which crops can be grown in order to bring in the most money.

Let us hear the story of Mr. Garson, who has a farm at Aylmer, north of Lake Erie. Find Aylmer on the map on pages 104-105.

The Garsons' new farm. The day the Garsons moved to their new farm, they had a visit from a neighbour named Mr. Porter.

"Just dropped in to say 'Welcome,' " said Mr. Porter. "I'm glad to know that this place will be farmed again. It's good land, and well located too," he said, pointing off

towards the canning factories, which could be seen in the distance.

"Yes, I hope so," replied Mr. Garson, "but farming here is not the same as dairy farming in the Ottawa Valley. There the soil was heavy clay and here it is so sandy it feels strange."

"Yes, that's true," put in Mr. Porter. "There's none of your sticky clay here to slow up the spring's work while you wait for the soil to dry enough for ploughing. The light, sandy soil warms up quickly and helps us to get our vegetables started weeks ahead of other districts."

"So I was told," said the newcomer, "but before I finally bought the place, I sent a sample of the soil to the Agricultural College at Guelph. They tested it and gave me a helpful report. I learned that the main thing the land needs is fertilizer."

"You are lucky to have fields with a good cover of clover," said Mr. Porter. "You will find that, when it is ploughed in, it adds just what the fields need to produce good crops."

The weeks that followed were busy ones

on the Garson farm. Ploughing and seeding were soon finished, in spite of a few rainy days. Long rows of peas, beans, and corn were planted — each crop in a separate field. Later, hundreds of tomato plants were set out.

The vegetables grew rapidly in the warm, light, easily-cultivated soil. The gentle spring rains and the long, sunny days of June and July made the plants beautiful to see. Acres of beans and peas were soon ready for picking. Most of the vegetables were sent to canneries not far from the farm. There they were cooked and sealed in tins or bottles. Some of them were made into soup, pickles, and ketchup.

Each year thousands of gallons of Ontario ketchup are used in New Brunswick for packing sardines in tomato sauce. Read the labels on tinned goods at home or when you go to the store. Can you find any vegetables from Ontario farms?

West of Mr. Garson's farm much of the land is used for growing sugar beets, corn, and some wheat. In the most westerly part

Farmland north of Lake Erie. Notice the curved or "contour" ploughing to hold the soil.

Ontario Agricultural College, Guelph





Tobacco in southern Ontario. Preparing the crop for drying in the heated kilns shown.

of the region, east of Lake St. Clair, tobacco is an important crop. Apples and other fruits are grown throughout the region.

Higher land east of Lake Huron • East of the southern end of Lake Huron, where the land is higher, livestock farming is common, and cattle, sheep, and hogs are raised. There is some dairying too, but less than in the wetter eastern parts of the province.

Farming in Northern Ontario • So far we have talked about farming in Southern Ontario. Turn to the map of Ontario on pages 104-105

and locate the part of the Laurentian Upland that is shown. What have you learned that will tell you that most of this huge area is not used for farming?

There is, however, one farming area in this region. It is the Clay Belt, stretching from west of Kapuskasing, east to Lake Abitibi, and into Quebec Province. Here, in a long trough in the rock, clay was laid down at the bottom of an ancient lake. After the lake drained away, the clay became good soil. This soil is deep and fertile enough in certain areas for successful farming. Although the growing season is short (often no more than ninety days), plants grow quickly here because the days are longer here in summer than they are farther south.

The crops grown in the Clay Belt are those that will ripen during the short summer. Such crops are hay (which makes possible dairying or stock-raising), oats, potatoes, and hardy vegetables. Local mining and lumbering towns buy most of the produce.

Farming here is carried on in much the same way as it was farther south during the early days. When new land is to be used, the thick forests have to be cleared, with the lumber serving as the farmer's "crop" until he has enough land on which to sow. Some farms in this region have been deserted because the settlers found the life too hard.

A dairy herd on the flat plain of the Clay Belt.

Courtesy of Canadian National Railways



However, many settlers have succeeded, and are making a good living.

SOMETHING TO DO • Pretend that your father is going to buy a farm in Ontario. In what area would you suggest he do so? Give reasons for buying a farm in the area you have suggested.

MANUFACTURING IN SOUTHERN ONTARIO

Where many people live • You have learned about the fine farms in Southern Ontario, but you know from your journey along the Seaway that farming is only one way of earning a living in this rich province. Look at the map on page 16 which shows where the people of Canada live. You will see that Southern Ontario and the district around Montreal in the Province of Quebec form the most densely populated parts of Canada. Where many people live close together in North America, you may be fairly certain that the work they do is manufacturing and trading; and this is indeed the busiest manufacturing region in Canada. In this small area live half the people of Canada, producing more than half of our manufactured goods.

Advantages of the area • Let us think of some of the reasons why this area, and especially the Ontario part of it, makes so many different kinds of goods.

1. First of all, the area has a great deal of cheap hydro-electric power from the Laurentian Upland, from Niagara Falls, and, of course, from the International Rapids of the St. Lawrence. Much electricity is also produced from steam power, made by using coal. The coal is easily brought in across the lakes from the United States. Most of the power is developed and sold by the Hydro-Electric Power Commission of Ontario.

2. Ontario has many raw materials from forests and mines and can easily import other materials such as coal and oil.

3. The large population provides plenty

of skilled labour. This population is also able to buy some of the goods that are made. Of course, too, people in every part of Canada use goods from this region, and many goods are sent abroad as well.

4. Transportation by road, rail, and especially by water has been well developed on the Great Lakes and the St. Lawrence. Raw materials are cheaply imported, as we have said, and finished goods are easily sent out.

5. Southern Ontario is close to the leading manufacturing centres of the United States, and many American companies have built branch factories in the province.

Now let us see what goods the people are making in this prosperous region.

Food products • On page 101 we read how canning factories use the vegetables and fruits that are not eaten fresh. Where dairying is common, milk products are manufactured: butter, cheese, and condensed and powdered milk.

The livestock raised in the province and the animals imported from western Canada make possible large slaughtering and meat-packing plants such as those in Toronto. Where meat packing is carried on, other industries spring up to use the hides, horns, hoofs, and other parts of the animals. Thus we have tanning and leather works, and the manufacture of soap and gelatin.

The wheat that is produced in the province and that brought in by boat to the many lake ports lead to flour milling and the making of bread and biscuits. Breakfast foods are also made: corn flakes at London, oatmeal at Peterborough, and shredded wheat at Niagara Falls.

Tobacco products • Millions of cigarettes are made from the tobacco that is grown near Lake St. Clair.

Textiles and clothing • Such large numbers of people need quantities of clothing. Not only does Ontario supply most of its own clothing needs, but it is able to manufacture enough



SOUTHERN ONTARIO

LEGEND

NATIONAL BOUNDARIES
PROVINCIAL BOUNDARIES
MAIN RAILWAYS
CANALS

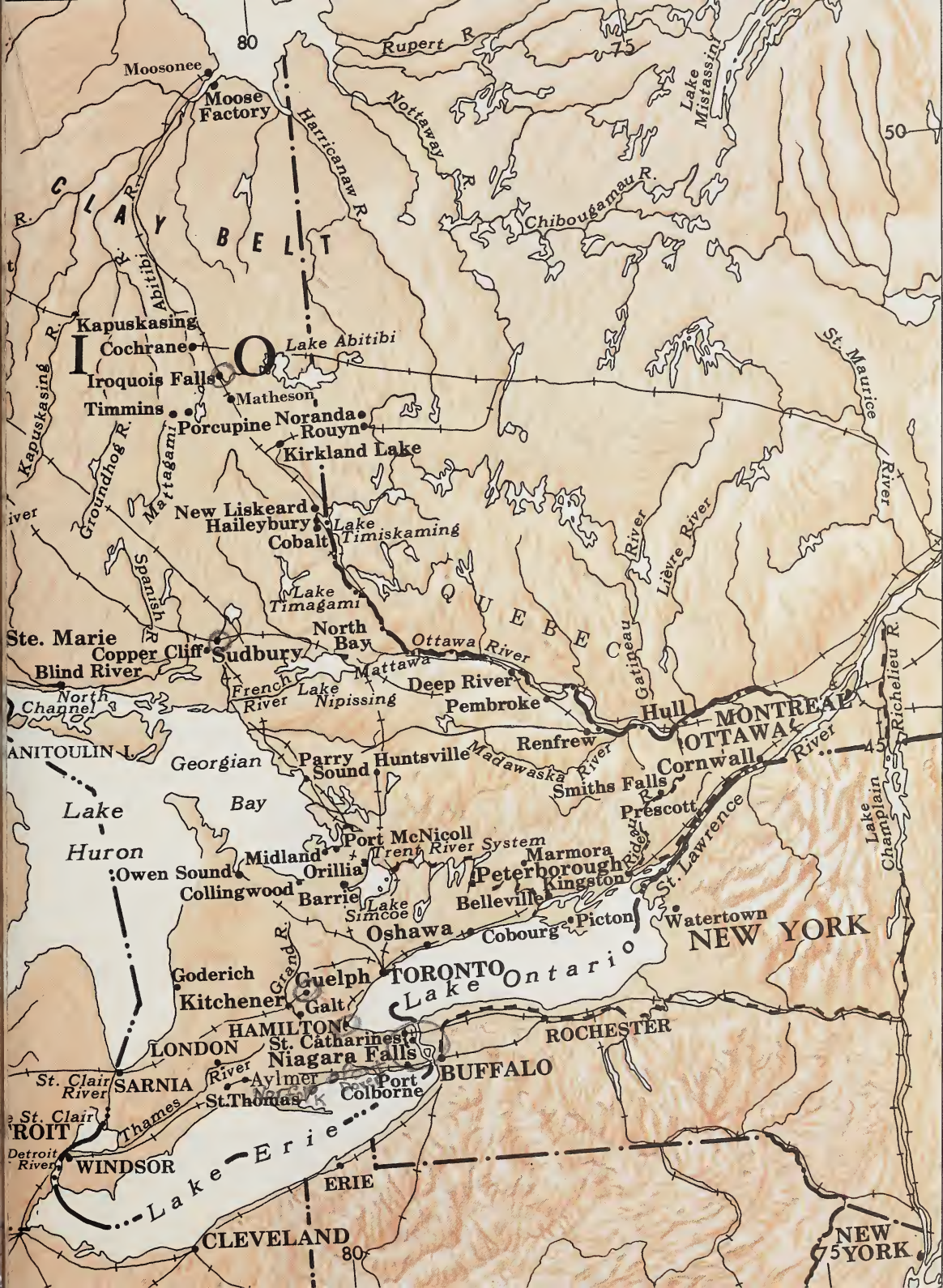


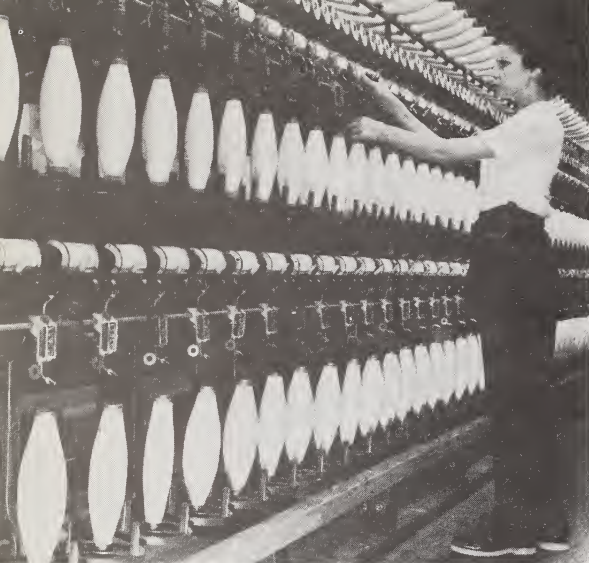
SCALE OF MILES

0 50 100 150 200



CHICAGO





Du Pont of Canada Photo

Nylon yarn being wound onto spools in a plant at Kingston.

to send some to western and northern Canada. Cotton goods, rayon goods, hosiery, knitted goods, and some woollen goods are made in Ontario's mills. Raw cotton brought in cheaply from the United States, rayon made from the pulp of the northern forests, nylon made from coal, and wool from Ontario's sheep provide the raw materials for these *light industries*.

Steel Company of Canada. Kucera Airphoto



Iron and steel • The manufacture of iron and steel is one of the most important of Ontario's industries. On our trip along the Seaway, we saw the steel works at Sault Ste. Marie. Now let us visit a steel mill at Hamilton.

To make steel, iron ore, coal, and limestone are required. Only one of these, limestone, is found near Hamilton; but the coal and the iron ore can be brought in by boat. As shown on the map on page 100, the city is conveniently located not far from the routes of lake freighters. The coal is brought from ports on the southern shore of Lake Erie. The iron ore comes from Northern Ontario, Quebec, and the United States. The American ore comes from the Mesabi Range to the west of Lake Superior.

A visit to a steel mill • As we pass through the gate into the grounds of the steel mill, our first feeling is that we have entered a city within a city. At the gate-house, we ask permission to visit the mill. Once inside the grounds, we drive over good roads to the main part of the mill. Railway tracks run right into the buildings, and we see several freight cars standing in the yard. By the company's dock a lake freighter is unloading iron ore.

A steel mill at Hamilton. How many of the items mentioned in the story can you find?

The foreman of the plant meets us and starts to explain the many strange sights and sounds. Pointing to a building we passed on the way into the grounds, he tells us that there coal is baked in ovens to form *coke*. The baking drives off both moisture and gases from the coal. Coke is used in smelting iron because it burns with a hotter flame than does coal.

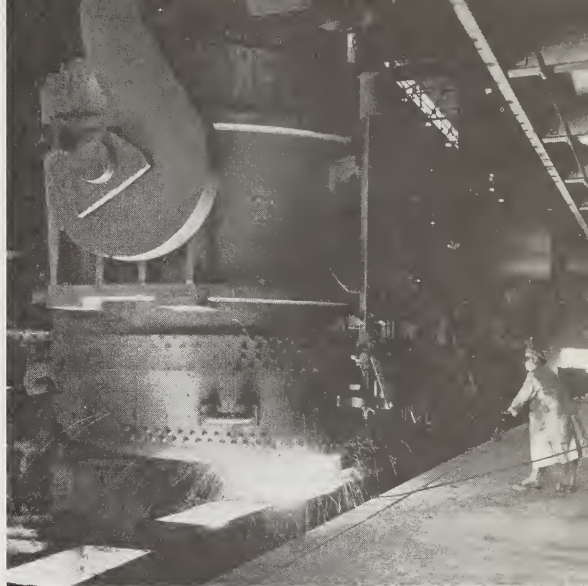
Next he shows us one of the *blast furnaces*. Here iron ore is treated to produce the metal, iron. Large cars on rails overhead carry tons of ore, coke, and limestone to the furnace where they are mixed together. The limestone helps to separate the iron from the rest of the ore.

When the mixture is ready, blasts of hot air are sent in near the bottom of the furnace. This makes the coke burn fiercely. The great heat causes the iron to melt and separate from the other materials in the ore. These other materials, along with the limestone, are lighter than the iron. They form slag which is "skimmed off." See page 68 to find out how slag can be used. The liquid iron, now white-hot, is poured by machinery into great buckets. These buckets then carry the liquid metal to the *open hearth furnace*.

In the open hearth furnace, steel is made. First to go into this furnace is the hot, liquid iron. To it is added scrap steel and several other materials. Then the heat is greatly increased. From time to time samples are tested. When it is exactly right, the liquid metal, which is now steel, is poured into large moulds. There it cools to form *ingots*.

The ingots are heated again and go to a *blooming mill*. There they are rolled into slabs, or *blooms*. These go to other mills to be made into rails, rods, sheets, pipes, and any number of other steel products.

CAN YOU ANSWER THESE QUESTIONS? 1. How is coke made? What is the difference between coal and coke?



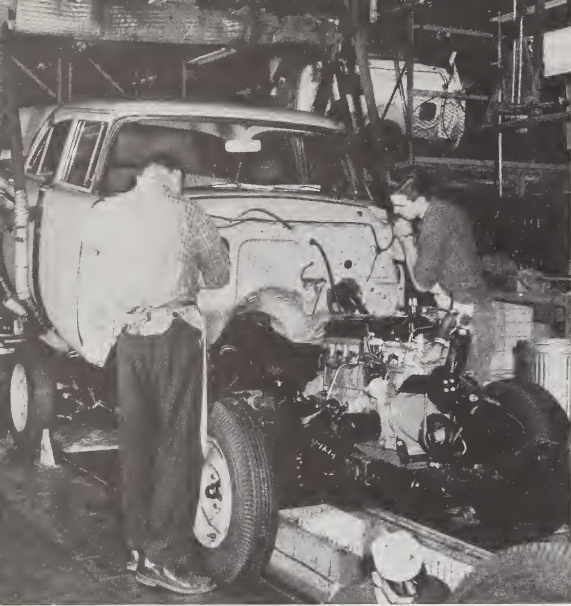
Steel Company of Canada, Hamilton. Carey Studio Photo

Pouring a steel ingot at an open-hearth furnace in Hamilton.

2. What materials are used to produce iron?
3. What is the chief product of a blast furnace? of an open hearth furnace? of a blooming mill?
4. What is the difference between iron and steel?

Articles made of iron and steel • There are too many of these to mention. A great deal of steel is used in making ships, locomotives, and many kinds of machinery. You have seen workmen using it in big buildings and schools. However, most of the iron and steel is used in the manufacture of automobiles, trucks, and agricultural machinery.

Automobiles. Most of the automobile plants in the United States are in Michigan. You can find this state on your map just west of Southern Ontario. The first Canadian plants imported the cars in pieces from Michigan and assembled them, or put them together. This explains why these factories were built in Southern Ontario. Today, cars are made at Windsor, Hamilton, Oshawa, and Oakville, and are sent all over Canada and to many other parts of the Commonwealth.



Ford Motor Company of Canada, Limited

A car on the assembly line at Oakville.

Automobiles are assembled from many separate parts, such as engines, bodies, wheels, tires, electrical equipment, and radiators. Many of the parts are made in smaller factories which are built close to the main automobile factories.

Agricultural machinery. What has been said about the automobile industry is also true about the making of agricultural machinery.

Many of the Canadian companies are branches of firms in the United States, which supply them with some of their parts. Farm machinery and tools are made at Toronto, Hamilton, and Brantford. The products of these centres not only meet Ontario's needs, but are also shipped to the farms of the prairies, and even abroad.

Furniture • Furniture is manufactured in such towns as Kitchener, Stratford, Guelph, Galt, Preston and Waterloo. Why is this so? In the early days, Southern Ontario was covered with fine forests of hardwood trees. From the wood of these trees, the early settlers made their furniture. Some of them became very skilful. Although the forests have long since disappeared — which shows what happens when they are not cared for — the skill in furniture making has been passed down to the present. Thus the factories have remained where there are good workers. The wood is now brought in from the forests of the Laurentian Upland in Ontario and Quebec. Some woods, such as walnut and mahogany, must be imported.

Electrical appliances • Where electric power is cheap, as it is in Ontario, many people use electrical goods: electric stoves, washers, refrigerators and home freezers, radios, television sets, toasters, and the like. Hamilton

RCA Victor Company, Ltd. Meco Photo



***Building
television cabinets
at Owen Sound.***

Looking south over
the St. Clair River
and the Sarnia
oil refinery and
chemical plants.



and Toronto are both important centres for making these articles.

Chemicals and refining • In southwestern Ontario, salt is obtained from deep underground. Pipes are sunk down to the salt deposits and water is pumped into them. The water dissolves the salt to form *brine* which is then pumped to the surface. Salt obtained in this way is refined at Windsor and Goderich. From the waste products of the salt refining, chemicals are manufactured.

On page 95 you read that at Sarnia chemicals are made from the waste products of oil refining. Such waste products include sulphur, tar, and certain liquid materials. These are used in making such things as antifreeze and the plastic bags in which your mother sometimes buys her vegetables from the store. Synthetic rubber is made there, too. Many towns, such as Hamilton, Welland, and Kitchener, make rubber goods. Sarnia is not the only place in Ontario where oil is refined. One of the biggest refineries in Canada is between Hamilton and Toronto.

Other chemicals are made from the waste

products of metal refining. One of these waste products is the slag we saw in the steel mill at Hamilton. Some of the chemicals produced are acids, ammonia, fertilizers, and medicines. Plants producing these are found at Toronto, Niagara Falls, and Sudbury.

Do you remember seeing Port Colborne when we sailed through the Welland Canal? Nickel is shipped from Northern Ontario to be refined where there is plenty of power. At Port Hope on Lake Ontario there is a radium and uranium refinery which uses materials produced in northern Canada.

Atomic energy • During and after World War II, Canada was one of the first countries to be interested in this new and important form of energy. Our atomic scientists do much of their most important work at Chalk River, a town in the Ottawa Valley, northwest of Ottawa. A power plant is being built at Des Joachims by the Ontario Hydro-Electric Commission to produce electric power from atomic energy. Other countries such as India have asked for Canada's help in developing atomic power.

Many other industries • The families of the many thousands of workmen employed in these factories, mills, and refineries require furniture, boots and shoes, clothing, housing, and thousands of other things. To satisfy these needs, many other industries have sprung up. It is therefore easy to see why Southern Ontario is the greatest manufacturing area in Canada.

SOMETHING TO DO • Draw a large outline map of Ontario. It should be big enough to use as a wall display. Use letters (A, B, C, etc.) to show the main farming regions. Use coloured markings to show the chief crops. A different colour should be used for each important crop. Your teacher will help you with this.

Print on your map the name of each city you have studied so far. Put a dot beside the name to show exactly where the city is. Beside the city print (in small letters) the name of *one* important product manufactured there.

Your map must have a key to explain what the letters and colours mean.

TWO IMPORTANT CITIES

In our discussion of manufacturing, we have mentioned many different cities and towns. Most of these are found in Southern

Ontario, which has more large towns than any other part of Canada. Let us now take a closer look at two of these cities.

Toronto • This is the second largest city in Canada and the capital of the Province of Ontario. From a tiny settlement on the shores of Lake Ontario it has grown to be a sprawling city of nearly a million and a half people.

If you look at the map on pages 104-105, you will see that almost due north of Toronto lies Georgian Bay. The overland route between it and the site of the present city was a short cut for Indians travelling from Georgian Bay to Lake Ontario.

The map on page 111 will show you that a small bay helped to decide the location of Toronto. This bay forms a fine harbour, sheltered from the open lake by several islands. The bay now has two entrances, although once it opened only to the west. Concrete walls line both entrances, forming canals. The western gap is the more important one, because the eastern entrance *silts up*, or fills up easily with material carried in by river and lake waters. The bay itself has been dredged.

The shallow part of the bay near the shore



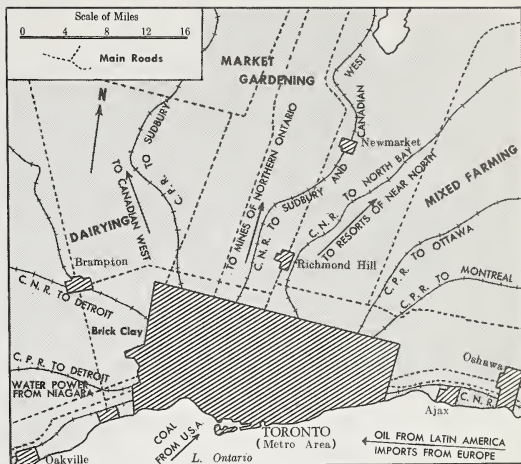
Waterfront, railway yards, and part of the financial district in Toronto.

has been filled up with crushed rock and other material. Grain elevators, flour mills, railway yards, shipyards, and the like now occupy this new land gained from the lake waters. It is lined with many miles of concrete piers. Ships from many lands can be seen here — more than ever since the building of the Seaway. As you read about Toronto, try to discover why it has grown to be so large while other cities remain small.

The first place you must turn for help is to your map. Look at the map on pages 104-105 and locate Toronto on the northwestern shore of Lake Ontario. Any ship sailing on the Great Lakes can reach its harbour, bringing raw materials to be manufactured into finished products. Coal needed for manufacturing is brought to Toronto from the south shore of Lake Erie. Oil is brought in by pipe line and tanker from Sarnia. Natural gas reaches Toronto, carried by pipe line all the way from Alberta. Is it not wonderful to think of oil and gas being brought more than two thousand miles to supply this great city? Study the map on page 141 to see how the pipe lines bring these products to Ontario from the West.

Many years ago the first roads were built to connect Toronto with other settlements. Today highways fan out in all directions. So do railways and airways. These routes go west to Windsor, Sarnia, and the West; north to Owen Sound on Georgian Bay and to the mining region of Northern Ontario; and east to Ottawa, Montreal, and the Atlantic Provinces. Thus goods can be shipped easily and quickly to and from the city.

As well as being a great manufacturing city, Toronto is also an important business centre, with many banks and the head offices of mining and industrial companies. A clerk in one of the big banks in Toronto is glad to tell us about the work he does. Here is his story.



Toronto and the surrounding area.

"My name is John Smith. I work in a big bank on Bay Street in Toronto. My home is in Willowdale, north of the city, and so it takes me some time to reach the bank. A bus from my house takes me to the north end of the subway line. You may know that Toronto built the first subway line in Canada. More lines are being planned, because our population is growing so fast. Travelling rapidly on

The Provincial Parliament Buildings in Toronto.

Ontario Dept. Travel & Publicity





Canadian Bank of Commerce. John E. Milne Photo

One of the many banks in Toronto.

a subway train, I reach the business centre of Toronto in a few minutes.

"The bank in which I work is very large, with hundreds of clerks. No doubt you would like to know what services a bank provides. Let me tell you something about it.

"There are thousands of people who want a safe place to keep the money they are not

using. They bring it to the bank and we take care of it for them.

"A manufacturer may want to buy large quantities of coal or raw materials from another city, or even from another country. We are able to help him to send his money safely to these other places; by using cheques or *drafts*, he is able to pay for the goods.

"Sometimes a man who is going to open a new store or business comes to the bank to borrow the money he needs. If we think he is honest and will be able to pay us back later on, we lend him the money and he signs a *note* promising to pay what he has borrowed by a certain date. He also agrees to pay the bank a certain extra amount, called *interest*, for lending him the money.

"The other day a man who is going on a trip to Europe with his wife came to buy *travellers' cheques*, which are safer to carry than money. No one but the person whose name appears on such a cheque can cash it.

"These are only a few examples of the work done by a bank, but they will show you how we serve both business firms and ordinary people."



A scene in Toronto's busy harbour. Notice the red and black crane which helps to load and unload the freighters.

From what port does the closest ship come?



Niagara Falls, the American Falls in the foreground and the Canadian Falls farther back. The bridge links Canada with the United States. Notice the power plants and factories.

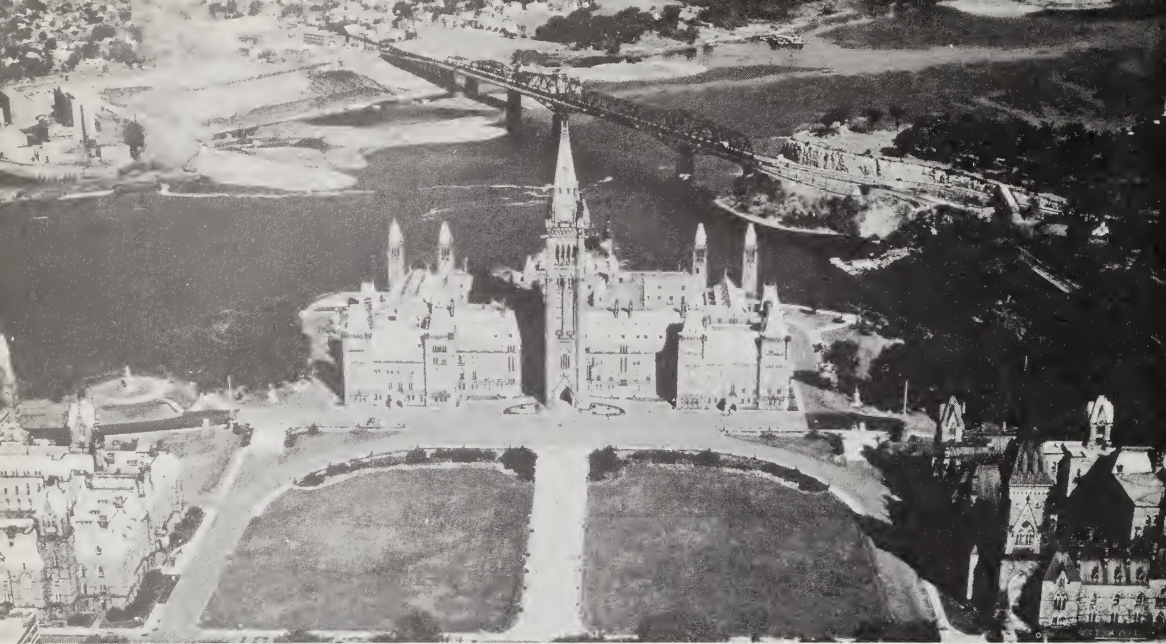
Besides being a great port and a manufacturing and commercial centre, Toronto is one of the leading educational centres in Canada. Its colleges and university educate students from Ontario and other parts of Canada, as well as from foreign lands. Toronto is the most important centre in Canada for printing and publishing books and magazines in the English language.

Because the city and the surrounding towns have been growing so fast, Greater Toronto has been organized as a metropolitan district. Although each town in the district looks after most of its own affairs, the "Metro," as the local people call it, looks after matters like the water supply, the police force, and the fire department. Each town used to build its own roads. Now Toronto and all its suburbs work together to plan good roads and streets for the whole area. Other large Canadian cities are watching the Toronto "Metro" system to see if it may help solve their own problems.

A side trip to Niagara Falls • From Toronto it is easy to visit the famous falls. We can take a train or bus around the west end of Lake Ontario, or cross the lake by a small excursion steamer. Let us choose the water trip, as we can then see more of the Niagara River.

Our steamer carries us across the lake and up the river as far as Queenston. From here we continue by bus. Far below us is the Niagara River, hurrying down the gorge. At last we come to the falls themselves. The best view is from the Canadian side, where through the mist of spray that is constantly rising we can see both the Canadian and the American falls, separated by Goat Island. People come from many lands to see this beautiful sight.

The falls are not only beautiful, they are useful too. The great hydro-electric plants on both sides of the river manufacture power for Canadians and Americans. Name some cities that get cheap electricity from Niagara Falls.



Canadian Government Travel Bureau

The Parliament Buildings at Ottawa. Hull, in the Province of Quebec, lies on the opposite bank of the Ottawa River. Notice the pulp mill with its log pile and floating booms of logs.

Ottawa — our capital • Ottawa, the capital of Canada, is located on the Ottawa River which forms the boundary between Ontario and Quebec. Across the river from Ottawa is the busy city of Hull, in Quebec. Between Ottawa and Hull are the Chaudière Falls, whose power is used for local industries. Ottawa is a big lumbering centre, and is one of the most important cities in Canada for the manufacture of goods made of wood.

In the early days of Canada's history, Ottawa (then called Bytown) became a settlement because it was at the head of navigation on the Ottawa River, at the point where the Rideau River flows in. A canal, called the Rideau Canal, was cut to link the Ottawa River and Lake Ontario. Once an important waterway, this canal is now too small for use, except by pleasure boats.

In 1858 Ottawa was chosen by Queen Victoria to be the capital of the united provinces of Upper and Lower Canada. A few years later, at the time of Confederation, the

city became the capital of the new country of Canada. Ottawa is a beautiful city, famous for its lovely parks and miles of scenic driveways along the Rideau Canal. Its fine Parliament Buildings are set on a hill overlooking the Ottawa River. Many government office buildings are scattered throughout the city.

Some years ago, Ottawa and the surrounding area were turned into a Federal District. This covers some nine hundred square miles on both sides of the river. Due to careful planning, Ottawa is growing into a capital of which all Canadians should be proud.

NORTHERN ONTARIO

Rocks, lakes, and trees • On your map of Canada on page 13, find the southern edge of the Laurentian Upland near Ottawa. Follow it westward from south of Algonquin Park to Sault Ste. Marie, and then along the north shore of Lake Superior. The line that you have been tracing is a very important one.

North of it we are in a land quite unlike that of Southern Ontario. Here is much bare rock of very great age. Lakes seem to be scattered everywhere through the forests. There are large areas of the swampy land known as muskeg. The soil is usually thin and poor. Winters are cold and long, with the temperature sometimes dropping to 50 degrees below zero at places such as White River. Summers are warm, but the growing season is too short for many crops.

Northern Ontario is several times larger than Southern Ontario, yet it has less than half as many people as Metropolitan Toronto. Only a small part of the population is engaged in farming. Let us find out what kind of work is done by the rest of the people who live in this huge region.

Important mineral resources • Our journey along the Seaway took us to Sault Ste. Marie and the "Twin Cities." You may remember that we heard something then about iron mining at Steep Rock. Further east, near the shores of Lake Superior, are the iron deposits of Michipicoten. Locate this area on your map. These ores are shipped by lake freighter



Ontario Department of Mines

A pile of gold bricks at the Porcupine mine.

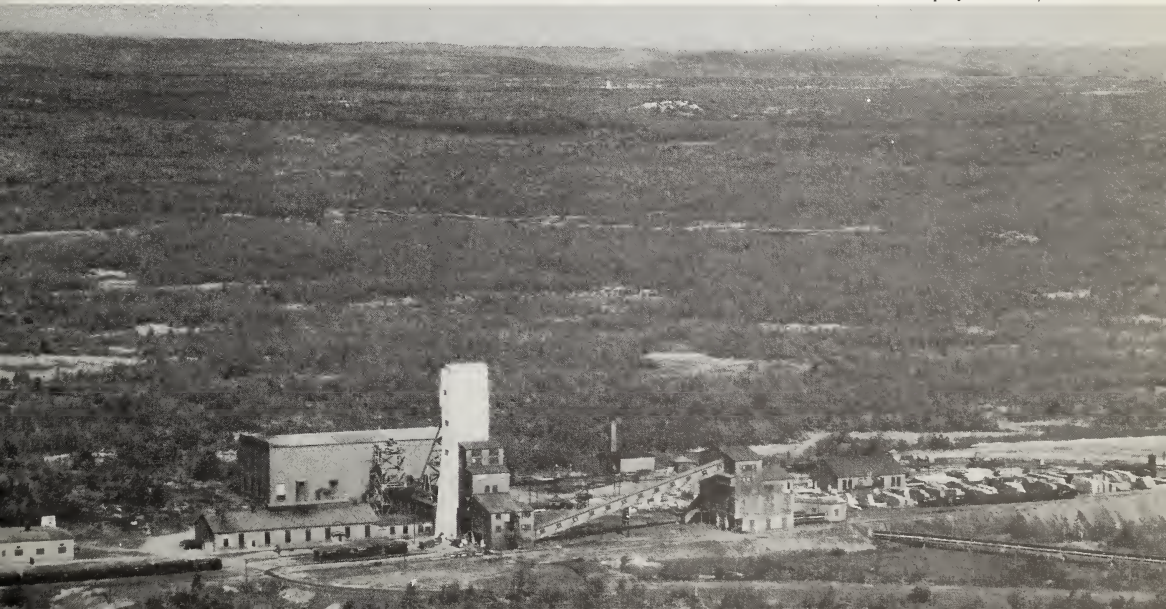
to Sault Ste. Marie, where, as you read on page 96, there is a large steel industry.

North of Michipicoten is Manitouwadge, where copper and zinc are mined. Further east again, is the town of Blind River. In this area are some of the largest uranium deposits in the world. What Canadian industry uses these uranium deposits?

Most of the mining of iron and uranium in Northern Ontario dates from the Second World War. Other kinds of mining there are older. Before 1900, nothing was known of the

A nickel mine in Northern Ontario. Notice the fairly level surface, exposed rocks, and scrub forest of this part of the Laurentian Upland.

The International Nickel Company of Canada, Limited





The smelter at Copper Cliff, where nickel, copper and other metals are obtained from the ore. Notice the slag in the foreground.

hidden wealth of Northern Ontario. The region was thought of as a rocky wilderness that made travel difficult between eastern Canada and the prairies. Then railways were built across it at great cost. During the building of these lines, metals were found, and the great mineral resources of Northern Ontario were discovered.

One of the early railways was the Ontario Northland which was built in 1903. If we travel northward from Toronto by train, we shall be able to visit the places where mining began in Northern Ontario.

In a few hours after leaving Toronto, we reach the city of Sudbury. Not far away is Copper Cliff, with its great smelter whose tall

chimneys can be seen for miles around. In this Sudbury-Copper Cliff area are the largest nickel mines in the world. The ore from these mines contains not only nickel, but copper, iron, and the very valuable mineral, platinum, as well. When the ore has passed through the smelter, the copper obtained from it is refined at Copper Cliff. Some of the nickel is shipped to the refineries at Port Colborne, and much of the rest is sent overseas. The iron used to be wasted, since it was too expensive to separate it from the slag. Now a cheaper method has been discovered, and a new smelter has been built at Copper Cliff which is re-refining the slag from the nickel smelter to obtain the iron.



National Film Board Photograph

A uranium mine at Blind River. In which physical region is Blind River located?

Travelling on northward, we pass through Cobalt, which used to be one of the most important silver-mining camps in the world. Silver is still mined here, along with the metal called *cobalt* which gives the city its name. This metal looks like nickel and is used in making certain kinds of steel.

After leaving Cobalt, we come next to Matheson, where there are important asbestos mines. Still farther north, we reach the

The modern method of bringing logs from forest to mill. Here trucks cross a frozen lake.

International Harvester Photo



modern gold-mining towns of Kirkland Lake, Timmins, and Porcupine. In and around these towns are many other mines, and still others are opened from time to time. This is one of the greatest gold-mining areas in the whole world. It is a continuation of the Noranda-Rouyn mining region of Quebec.

Wealth of the forests • Miners are interested in what can be found deep in the ground, but there is also wealth on the surface in Northern Ontario. Our train rolls on through forests of pine, balsam, spruce, and tamarack. These dark-green northern forests supply wood for making paper — such paper as this book is made of. Where there are waterfalls to provide cheap electric power, and plenty of logs to be floated down the rivers, there are giant pulp and paper mills, such as those at the town of Iroquois Falls and at Kapuskasing, farther west.

Railway workers • This northland is a region of forest workers, paper-mill workers, and miners. There is one other very important group of people — those who work on the railways. On the map on page 116, find all the railways that cross Northern Ontario. There are three main east-west lines, in addition to the Ontario Northland which goes northward to James Bay. Can you imagine the number of people who are needed to keep the trains running through this northern wilderness? Not only is the land surface difficult for the building and operating of railways, but the trains must be kept running during some of the coldest winters in the world.

Because the train service is good, the people who live in the small towns of Northern Ontario can buy many of their supplies in the large cities of Southern Ontario, and can obtain the Toronto newspapers before they are more than a day or two old. Over the years, branch lines have been built to connect new mining centres with the main railway lines. A good example



Courtesy of Canadian National Railways

Loading Steep Rock ore. Mining depends on cheap transportation, to get the ore to refineries or steel works.

is the line to Manitouwadge. Do you remember what is mined at Manitouwadge?

A fine tourist country • Northern Ontario stretches westward to meet Manitoba. The country between Lake Nipigon and the Lake of the Woods delights fishermen and hunters. Many go there by rail, road, and air from the large cities of eastern Canada and the United States.

The most westerly town of importance in Ontario is Kenora. It is an important stop on the Canadian Pacific Railway, and there are flour mills and lumber mills beside the tracks. The town is also on the Lake of the Woods, where the sheltered bays among scattered wooded islands are lined with summer homes.

Ontario's tourist country is not found only in the north and west. Farther south there are two well known tourist resorts — the Muskoka Lakes and Algonquin Park.

Four ways west • There are now four ways of reaching the far northwestern part of Ontario from the east. The oldest is the water route by way of the Great Lakes. Next came the railways. They were followed by the airway operated by Trans-Canada Air Lines.

Now a fourth route has been added — that of the Trans-Canada Highway.

CONSERVATION

Lack of water • You have read that Northern Ontario is a land of dense forests and many rivers. In pioneer days Southern Ontario was also a land of trees and streams. Today most of the trees of this part of the province are gone and many streams have dried up. In the spring, the remaining streams are rushing torrents which flood their banks and do much damage, while in the summer they have only a trickle of water or no water at all.

This is very serious, for without water crops cannot grow. In Southern Ontario many streams and farm ponds used for watering cattle are drying up and some farms have already been abandoned because of this. Wells on which some towns and cities depend are also giving less water. What causes this and what can we do about it?

What our forests mean to us • Forests have an important influence on the water supply underground. The long roots of the trees reach down into the ground, breaking up the hard soil. The soil and the leaves which



Ont. Dept. of Lands & Forests

Planting trees in a gully to prevent further erosion. How will trees help?

fall to the ground act as a sponge. Much of the rain and the melting snow soaks into this covering with its network of roots and is held there. Instead of running off, the water remains in the ground.

In pioneer days when Southern Ontario was covered with forests, the settlers needed wood with which to build and heat their houses. They also had to clear the land in order to plant their crops. Today almost all the land is cleared of forests and the water is not so easily held in the soil. It runs off the land quickly, flooding the rivers. Then, when dry weather comes, there is no water stored in the ground to feed the streams and wells.

Ont. Dept. of Lands & Forests



Contour furrows for tree seedlings have been ploughed on this hilly land to prevent erosion.

These soon dry up, and the whole area suffers from drought.

What floods do • The best and most fertile soil is the *topsoil* — that is, the soil on the surface of the land. It is only a few inches deep and takes hundreds of years to form. When land is flooded, or when water drains over it too quickly, this valuable topsoil is washed away. You may have seen the muddy brown colour of a river in flood. That muddy brown colour means that the best of our farmland is being washed away. Not only in Southern Ontario, but in many other parts of Canada, we need to conserve our soil, because our future food supply depends on it.

Reforestation • Probably the first and most important thing to do is to stop the wasteful cutting of trees and then to plant more. On land which is not suited for farming, many trees can be planted. This work of replacing the forests is called *reforestation*.

Conservation of water and soil • Trees take a long time to grow, however, and it will be many years before those planted now are big enough to be of help in keeping up the water supply. In the meantime there are other things that can be done to help. The draining of many swamps should be stopped. We can encourage water to soak into the ground instead of hurrying off to the nearest river. We can also lead the water into a farm pond built on low-lying land.

Farmers can help to keep up the water

supply and also protect the precious topsoil by ploughing around the sides of hills instead of up and down the slopes. Each ridge left by the plough then holds back the water and gives it a chance to soak into the ground. In places where the topsoil has been washed away, coarse grasses can be planted. The roots of the grasses keep the soil from blowing about, and also catch the rain water and keep it from draining away.

The farm woodlot • When we think of the value of forests, we must not forget the importance of farm woodlots. Nearly every farm has some land on which only trees will grow well. This land can be made to yield a fine crop of trees each year, providing a good source of income, and at the same time helping to conserve both soil and water.

To get the most out of a woodlot, the trees should not be crowded. Only trees which have reached full size should be cut down. Above all, the woodlot should be well fenced, to protect the seedlings and young trees from farm animals. Farmers should learn to protect their trees also against insects, disease, and fire.

We must work together • The government is doing much to protect lands and forests all over Canada and to repair the damage that has already been done to them. But the government cannot do the work alone. We must all do our share to preserve our country's soil.

THINGS TO DO • 1. Give at least two reasons why more manufacturing is done in Ontario than in Quebec. Remember that neither province has coal, but each has plenty of water power and a good water route.

2. Give as many reasons as you can to explain why more farm machinery is manufactured in Southern Ontario than in Quebec.

3. State one important industry of (a) Windsor, (b) Sarnia, (c) London, (d) Hamilton, (e) Sault Ste. Marie, (f) Peterborough.

4. What industries are a result of stock rais-

ing in western Ontario and of dairying in eastern Ontario? Explain the reason for each.

5. Ontario produces more cheese than any other province. In what parts of the province would you expect to find most of the cheese factories?

6. Give three reasons why tobacco is grown in southwestern Ontario.

7. Why are there so many canning factories in Southern Ontario?

8. Find out the uses for gold, nickel, cobalt, and platinum. Where is each produced in Ontario?

9. Name and locate each of these cities of Ontario:

- a. The capital of Canada
- b. The capital of Ontario
- c. An important iron-and-steel centre of Ontario
- d. The chief nickel-mining centre
- e. Three gold-mining centres
- f. Five important lake ports
- g. The "Twin Cities"
- h. Two railway centres (use your map)
- i. Two cities making breakfast foods
- j. Three cities manufacturing automobiles
- k. A new town created by the Seaway
- l. A place where nickel is refined
- m. A uranium-mining centre
- n. An iron-mining centre
- o. Canada's headquarters for atomic energy work

BOOKS TO READ • For the pupil:

Story of Ontario, by J. M. SCOTT (Dent)

Cargoes of the Great Lakes, by M. MCPHEDRAN (Macmillan)

The Great River and the Great Lakes, by J. M. SCOTT (Copp Clark)

We Live in Ontario, by M. BRAITHWAITE and R. S. LAMBERT (Book Society)

For the teacher:

The Northland of Ontario, by O. G. WILLIAMSON (Ryerson)

For reference:

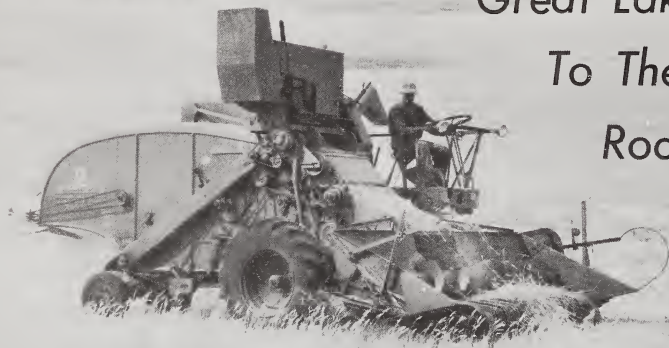
Salt, Its History, Development, and Uses

(Canadian Industries, Limited, Montreal)

Steel Industry (America at Work Series), by

JOSEPHINE PERRY (Macmillan)

V • From The Great Lakes To The Rocky Mountains



International Harvester Photo

Harvesting wheat on a Saskatchewan farm.

THE PRAIRIE PROVINCES

A LINK BETWEEN EAST AND WEST

A central location • On the map on pages 124-125, locate the three Prairie Provinces — Manitoba, Saskatchewan, and Alberta. Each of the three has its own capital city where the business of government is carried on. Find these capital cities — Winnipeg, Regina, and Edmonton — on the map.

Find the southern boundary of the Prairie Provinces. If this line were continued eastward, it would cross the Lake of the Woods in western Ontario, pass just north of Lake Superior, enter Quebec to the north of Noranda, and cross the St. Lawrence near the mouth of the Bersimis River. Is your home south of this line? The whole of the three Prairie Provinces lies to the north of this line. Remember this when you read about life there. As the map on page 16 shows, most of the people between the Great Lakes and the Rocky Mountains live in the southern part of these provinces, while much

of the northern region is empty. Can you think of reasons for this? Make a list of them and add to it as you read on.

MAP STUDIES • 1. Using the map on page 192, trace the western edge of the Laurentian Upland. In which of the Prairie Provinces is there the greatest area of this region? In which is there the smallest? This region is different in many ways from the prairies. Much of it is made up of bare rock, forest, swamp, muskeg, lakes, and rushing rivers, just as it is in northern Ontario and Quebec.

2. Notice the chain of lakes around the edge of the Laurentian Upland. In Manitoba you can see three of these lakes — one very large, and two smaller. On the map on pages 124-125, find their names, write them down, and learn to spell them. The names were given to them by the Indians. Do the same with the large lake in northern Alberta and Saskatchewan.

3. In which of the Prairie Provinces do you find high mountains? What is their name?

4. Which of the Prairie Provinces borders on Hudson Bay? Find its chief seaport. Give a reason why this port is used for only three months during the year. With a piece of string, measure on a globe the distance from this port to Liverpool in England. Do the same for Montreal and Halifax. Which of these three Canadian ports is nearest England? Which is nearest Winnipeg?

THE NATURE OF THE PRAIRIES

A great stretch of land • As we stand on the Trans-Canada Highway at the boundary between Ontario and Manitoba and face west, the prairies stretch almost 900 miles between us and the Rocky Mountains.

The name "prairies" was given to some of this land by the first French explorers who visited it. The part that they saw was covered with grass, so they called it "prairie," or grassland. However, the idea that the Prairie Provinces are all grassland is quite wrong. Study the pictures in this chapter and re-read the description of the Laurentian Upland on pages 9 and 57-69. All three provinces have thousands of square miles of forest to the north of the prairies, while in the

western part of Alberta are the towering Rocky Mountains. Nor are these provinces all dry land, as some people think. All three are crossed by great rivers, and Manitoba especially has many large lakes. One of these is larger than Lake Ontario.

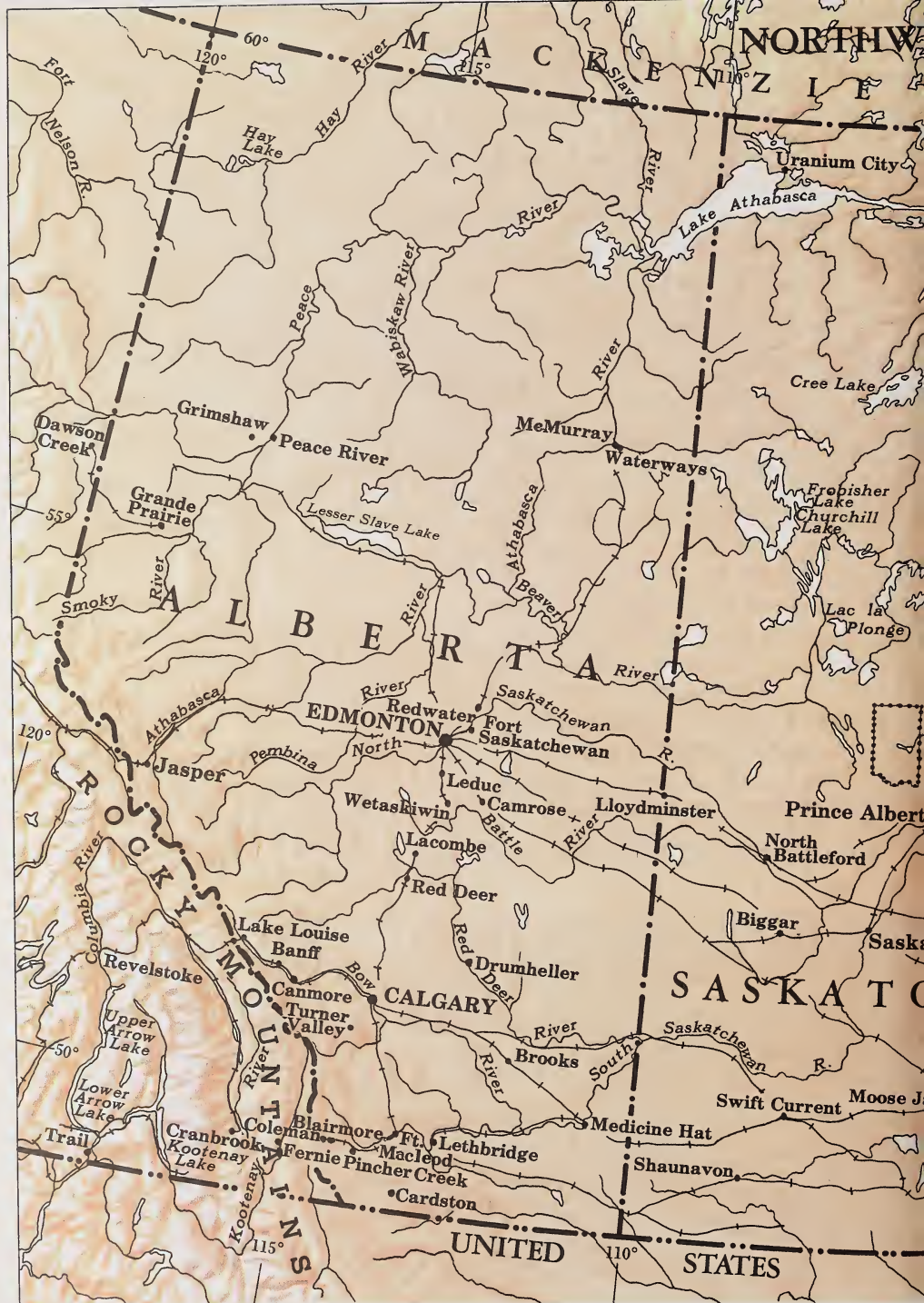
The real prairie • What does the real prairie look like? Those who have not seen it may think of it as being flat. It is not all level though, and in the west some of it is quite hilly. Although most of it was once covered with grass, there are parts, especially along the banks of the rivers, that are clothed with such trees as poplar, willow, and birch. Trees have also been planted in many places to serve as *shelter belts*, for protection against the strong winds that sweep across the level land. Most of the rivers flow in deep valleys, some as much as 100 feet below the level of the prairie. Here and there are shallow lakes, known as *sloughs*, some of which dry up in summer.

Three prairie levels • The map on page 126 shows that the eastern part of the prairies is almost flat. It is sometimes called the "First Prairie Level," and is one of the flattest regions in the world. At one time it

A cattle ranch in southern Alberta. Poor vegetation, caused by small rainfall, makes necessary pastures of great size.

National Film Board Photograph





THE PRAIRIE PROVINCES





A map showing the area included in each of the three prairie levels

lay at the bottom of a huge lake, which was several hundred feet deep where the city of Winnipeg now stands. We can still find the eastern and western edges of this lake, for they are marked by beaches that were once washed by its waters.

The lake drained away northward, leaving behind several smaller lakes, as well as the fertile plains of the Red River Valley. Beyond the western edge of this old lake, and at a higher level, is the "Second Prairie Level" shown on the map. It includes southwestern Manitoba, much of southern Saskatchewan, and the northeastern corner of Alberta.

Still farther to the west, the remainder of the prairies rises in low hills to the foot of the Rocky Mountains. It is shown on the map as the "Third Prairie Level," although a great deal of its surface is more hilly than "level."

All three of the prairie levels are higher than the St. Lawrence Lowland, and even higher than most of the Laurentian Upland. As the map above shows, most of the settled land of the three provinces, marked on the map like a chequerboard, lies on the prairie grasslands.

WAYS INTO THE PRAIRIES

Early explorers • In 1670 the Hudson's Bay Company was founded in England. To it was granted all the land whose rivers drained into Hudson Bay. This land, of course, included most of what is now known as the Prairie Provinces. The Hudson's Bay Company still has trading posts in northern and western Canada.

The first white man to reach the prairies was Henry Kelsey, who undertook to explore for the Hudson's Bay Company. It is not certain just where he went, but he must have reached the grasslands, because on his return he surprised his listeners by telling them of great herds of buffalo roaming over level plains. Later, in 1731, a French explorer, La Vérendrye, came from Montreal with his followers. He travelled by canoe, making his way by lakes and streams to the meeting place of the Red River and the Assiniboine, where the city of Winnipeg grew up many years later. There he built a fort, and then continued on westward.

Early settlements • The first settlers were Scotsmen, who came by way of Hudson Bay and the lakes and rivers of the north. They were sent out by Lord Selkirk in 1811, and

reached the Red River the following year. After all kinds of difficulties due to rival traders, floods, and grasshoppers, the settlers succeeded in gathering a harvest. Later, other settlers reached the prairies by way of La Vérendrye's water route from the east.

It was from the south that the next settlers arrived. They came by way of the farmlands of the United States, and travelled northward along the Red River Valley. Finally, when the railway from eastern Canada was completed along the northern shore of Lake Superior, hundreds of thousands of settlers were able to enter without suffering the hardships of the first pioneers.

Prairie farmers from many lands • The thousands of settlers who reached the western prairies after the building of the railways came not only from eastern Canada and the United States but also from the British Isles and many parts of Europe. People from these distant lands brought different languages and religions, as well as different ways of living. The older people remember the lands from which they came, but today most of them speak English and all have helped

to build a new nation among the rolling grasslands, forests, lakes, and mountains of the Prairie Provinces.

Today's routes • Today there are still three ways into the prairies from the east. One way is by road, rail or water from Ontario, reaching Winnipeg by way of Port Arthur or Fort William. The second lies through the United States, passing such cities as Chicago, Minneapolis, and Duluth. The third route is from the northeast, by railway from Churchill on the shores of Hudson Bay.

From the west coast still other settlers have entered the Prairie Provinces through the passes in the western mountains.

WHERE THE PEOPLE LIVE

Close together and far apart • Farmers of southern Saskatchewan and Alberta own large farms, some of which are several square miles in area. This means that the farm homes are far apart. People must travel long distances to visit one another, and the children may be several miles from a school. Along the banks of some of the rivers, such as the Red River and the Assiniboine, the

Many people live close together in cities like Calgary.

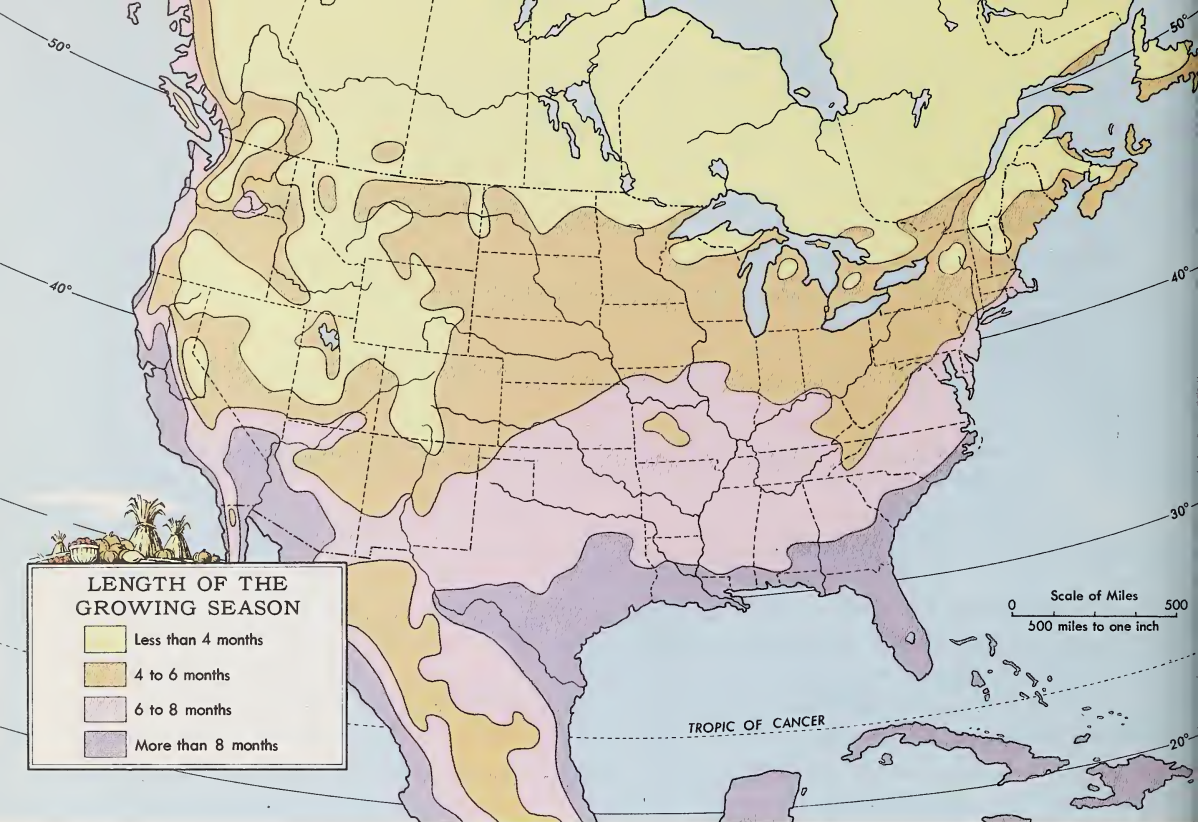
Courtesy of Trans-Canada Air Lines



In the great wheat lands of the prairies, homes are far apart.

Courtesy of Canadian National Railways





houses are close together and farmers have near neighbours, but on the land back from the rivers there are few houses. If you could see the mining towns of Flin Flon and Lynn Lake from an aeroplane, you would notice people living close together in a town, surrounded by empty land. (See the picture on page 139.) Near the railways, and especially where a main line crosses one of the large rivers, homes are crowded close together in a town or city. What are the reasons for these different ways of placing homes?

Railways and settlers • The railways of the Prairie Provinces are crowded together in southern Manitoba. Towards the north-west they spread out like a fan as they approach the Rocky Mountains in Alberta. Only four lines go through these mountains to the Pacific coast. There are good reasons for these different railway patterns.

Building railways on level land is much easier than among the mountains. Lines running westward from the Prairie Provinces to the Pacific coast must follow river valleys through the mountains. There are very few such valleys. Sometimes a tunnel must be cut through the mountains to link two valleys and so allow the railway lines to pass.

To the north of the prairies there are no mountains. Why then are the railways few? Railways are built to move freight and to carry people. Where there are few people and little freight to move, there are few railways, if any. Why there are few people in the northern part of the Prairie Provinces is not easy to explain. It has to do with the surface of the country, the climate, the soil, and the means of making a living.

Why people live where they do • To the north-east of the prairies lies part of the rolling

plateau of the Laurentian Upland. Here, among the bare hills, swampy hollows, and forests, few people live. There are, though, some places where small stretches of level land could provide homes for farmers. Why have settlers been so slow in moving into this northland?

The maps on this page help to explain why farming is carried on in some parts of the Prairie Provinces and not in others. The first map shows that only the southern part of the provinces has a long enough growing season to make it safe to grow most crops for sale.

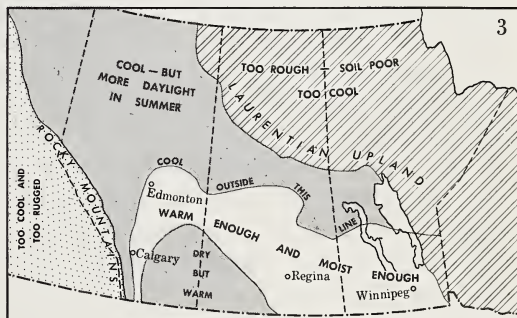
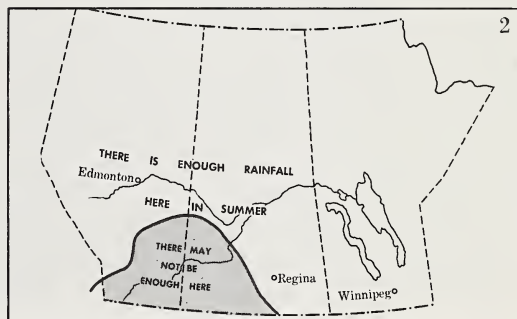
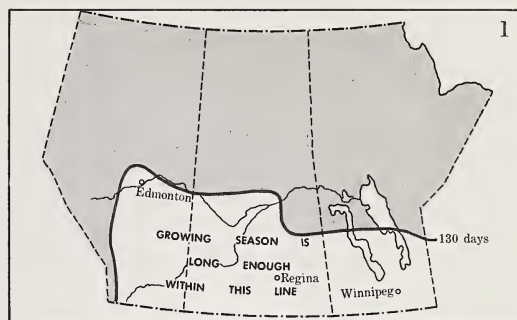
The second map shows that in southern Alberta and Saskatchewan there is a part of the prairies that does not get enough rain for growing crops without irrigation. (Compare this map with that on page 16). Here, too, there are few people.

Map 3 brings all our information together in explaining why only part of the Prairie Provinces is settled by many people. It shows that to the west there are rugged mountains; to the north the growing season is too short or the ground is too rough for people to make a living by farming; and in the southwest, farming without irrigation may be limited by lack of rain.

THINGS TO DO • 1. From what you have read, see if you can decide why some of the sloughs in the Prairie Provinces dry up in summer, although lakes in eastern Canada have water in them all the year round.

2. Discuss in class the reasons why farmers in southwestern Saskatchewan need larger farms than do farmers in the Red River Valley in Manitoba.

3. In your sand table, or in damp sand in a cake pan, the bottom of which is painted blue, make a relief map of the three Prairie Provinces, showing the three levels, the mountains in Alberta, and the largest lakes and rivers. Use white string laid on the sand to mark the boundaries between the provinces, and red string to



show the chief railway lines. Print the names of the principal cities on small slips of paper. Paste the slips around toothpicks, and stick these into the sand where the cities are located. Notice how many cities are placed where railways cross rivers.

4. To carry on farming successfully, a yearly rainfall of about 15 inches is needed, unless by some means irrigation is possible. In southern Alberta and southwestern Saskatchewan the

average rainfall is only 10 to 12 inches. The most important rainfall is that which falls during the growing season. Where there is snowfall, the melted snow is added to the rainfall in counting up the total for the year. In general, a snowfall of 10 inches equals 1 inch of rain. The amount of rain, plus the amount of melted snow, is spoken of as *precipitation*. On the map on page 15, find out how many inches of precipitation there are where you live.

WHEAT-GROWING ON THE PRAIRIES

Canada's wheat • If you were visiting Europe or some other part of the world and asked what the people there knew about Canada, they would probably answer, "It produces the best wheat." Almost all of the millions of bushels of Canadian wheat being sent overseas each year are grown in the Prairie Provinces. Saskatchewan is by far the most important wheat province, and Alberta and Manitoba rank second and third. The high quality of this wheat is known everywhere. In Ontario most of the wheat grown is sown in the autumn and remains in the ground all winter. In the Prairie Provinces the winters are so cold that almost all the grain is planted in the spring. This is why our western wheat is called *spring wheat*.

A visit to the wheat country • Bill Marshall from Kenora, in western Ontario, went to visit his uncle on a wheat farm in Saskatchewan. Here is a letter that he wrote to his father after he arrived.

Rural Route No. 1,
Regina, Saskatchewan.
June 22, 1962

Dear Dad:

I had a wonderful trip out here. I had been on the train only a short time when we left the lakes and hilly, wooded country which we have around home and came out onto the flat prairie. It almost took my breath away, everything seemed so different. You could

see miles and miles in all directions, and wherever you looked, there were great fields of grain, mostly wheat, I believe, waving in the bright sunshine.

A man who sat beside me told me that this area near Winnipeg is the oldest wheat country in the Prairie Provinces and some of the best. He told me a long story of how the first farmers to grow wheat here on the prairies came from Scotland by way of Hudson Bay. I had read about it in my history book, but how much more real it seemed as he told me the story! What a time they had with floods, grasshoppers, and rival fur-traders! But they kept on working, he said, and now "Manitoba No. 1 hard," Canada's best wheat, is known all over the world.

Another thing I did not know was that most of the wheat farmers who later ploughed up the prairie in Manitoba came from Ontario. They tried to grow Red Fife wheat, which they were used to in Southern Ontario, but on the prairie frosts came before the wheat ripened. Then scientists went to work, and in time developed a kind of wheat which ripens faster and is not ruined by the disease known as *rust*.

I could not see much of Winnipeg, but in the railway yards there the man beside me pointed out the long freight trains, loaded with wheat, he told me, ready to go to Port Arthur and Fort William.

Uncle Jim met me at the station in Regina. He said that he wanted to show me a bit of the city before we drove out to his farm. He is very proud of Regina. He said that the place where the city now stands had nothing but space when building started — no mountains for scenery, no river for drinking water, not even a tree within miles. Now there is a pleasant city with wide streets and modern buildings. The Legislative Building is surrounded by a park with many trees and what Uncle Jim called a "formal garden," all laid



Saskatchewan Government Photo

Regina from the air, with the provincial government buildings in the foreground.

out in a pattern with coloured plants and flowers. At the foot of the garden is a little lake, made by building a dam across a small stream. Water for the growing city is being brought across country from the South Saskatchewan River.

It was quite a long drive to Uncle Jim's house — about fifteen miles, he said — and what a drive! I never felt so small in all my life. The sky seemed so high above the flat land and the rim of the world so far away, and in all that space there seemed nothing but emptiness; just the two of us crossing the plain. The only movement that we saw was a train, like a child's toy, in the distance.

Your loving son,

Bill

From seeding to market • This is what Bill learned about wheat farming when he visited his uncle's farm:

Preparing the ground. To prepare the ground

for the spring seeding, the land is first ploughed. Sometimes the ploughing is done in the autumn, but usually it is done in the spring, as soon as the frost is out of the ground and the fields are dry enough to work. This is hard work, especially on new land. The picture at the bottom of page 132 shows how it is done. A tractor is used to haul one or more ploughs. Modern ploughs cut through the stubble and mix it with the soil. The chopped stubble then forms a blanket to keep the soil from blowing away.

Because wheat needs every possible day to ripen before the frost in the fall, no time can be wasted. Modern farm machinery is more powerful than the older models, so that one man can do the work of several. Many farmers now use machinery that ploughs, harrows, sows the seed, and covers it, all in one operation. Such machinery is expensive and requires checking and care by a trained mechanic. This is done during the winter,



Massey Harris

This disc seeder breaks up the clods of soil and stubble and sows the seed.

so that all will be ready when the long-looked-for day arrives and the farmer can begin his spring's work.

At last it is safe to begin. From dawn to dark the farmer drives back and forth across the long, level fields. Often, by using powerful headlights on his tractor, he works on through half the night. The plough cuts into the grass or stubble, the harrow breaks up the hard lumps of soil, and the drill drops the seeds into the furrows that it makes and covers them with earth.

Rain and sunshine. Now the farmer hopes for rain to start growth from the seed. If the rain lasts too long it is harmful, since it keeps the plants from developing long roots to reach the water underground. Without these long roots the wheat plants die during a dry summer. When the green shoots come up, more rain is needed to bring forth the many heads which will later hold the kernels of grain. Then the wheat needs heat and long hours of sunshine, and fine weather for the harvest. One of the reasons why so much wheat is grown on the prairies is that weather conditions there are generally very good: an early spring; enough rain in the spring and early summer; long, warm, sunny summer days; and a dry, sunny fall.

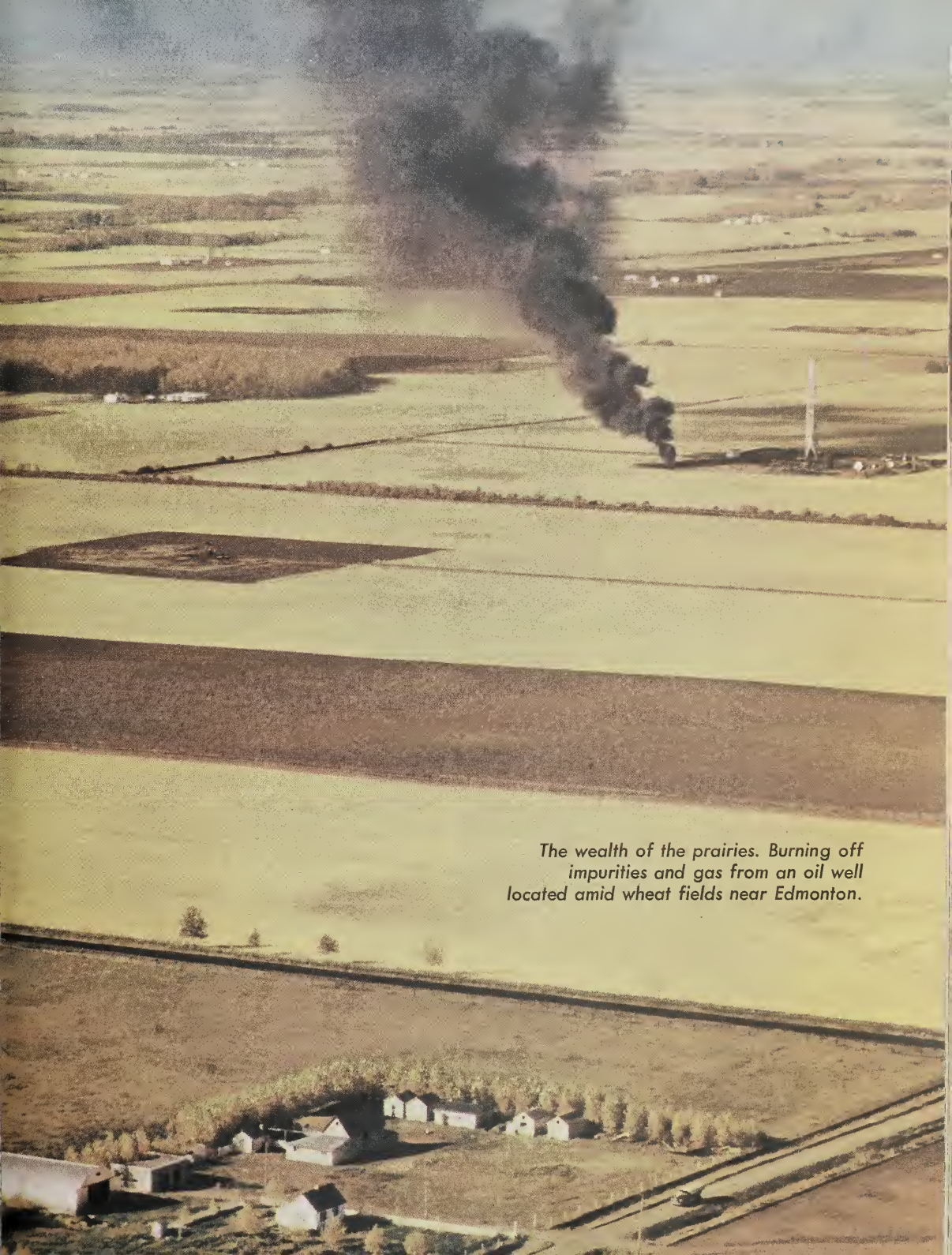
The harvest. When all goes well, the farmer looks out over his acres of ripened, golden wheat, whose stalks bend in the breeze, and decides that it is time to begin harvesting. Now, once more, there is much work to be done in a hurry. Often extra help is needed, although where modern machines are used, a few men can do the work.

Wherever the wheat can dry on the stalk before it is cut, a *combine* is used. This machine cuts and threshes the grain and delivers it into a truck moving beside it. Where the

Ploughing under the stubble in a wheat field. Notice the shelter belt of trees in the background.

Massey Harris





The wealth of the prairies. Burning off impurities and gas from an oil well located amid wheat fields near Edmonton.



Saskatchewan Government Photo

A modern combine, which gathers grain from the windrows, threshes it, and returns the straw to protect and nourish the soil.

wheat is not dry enough, a *swather* cuts the grain and leaves it in long *windrows*. Later, when the grain has dried, a combine passes over the windrows, picking up the rows of wheat and threshing it, blowing out the kernels in a stream into a truck moving alongside, and throwing out what straw remains.

To sell his grain, the farmer hauls it by truck to the nearest railway station. Sometimes he loads the wheat directly into a freight car, but usually he takes it to one of the grain elevators beside the tracks. Here the grain is dumped onto a moving belt, which carries it in pockets to the top of the elevator and pours it into large bins. From these bins the grain passes, as needed, through chutes into the freight cars waiting below.

From Alberta and parts of western Saskatchewan, much of the grain goes by rail to Vancouver and then across the Pacific Ocean to Asia, or by way of the Panama Canal to Europe. From the rest of the prairies, some wheat goes northeast to Churchill on Hudson Bay, and then by ship to Europe. This route,

however, can only be used for about three or four months during the late summer, when Hudson Strait is not blocked by ice.

Most of the wheat, however, travels eastward. If you were to look down from an aeroplane on eastern Saskatchewan and Manitoba during late summer and fall, you would see long trains, like tiny worms, all making for Winnipeg. It would surprise you to see so many long trains, and you would wonder how they could all get into the railway yards at one time. Winnipeg is a very busy place during the harvest season, and after it too. Let us see if we can find out why all the trains pass through Winnipeg.

In southern Manitoba, all trains from both east and west must pass along the narrow strip of land between Lake Manitoba and Lake Winnipeg on the north, and the Lake of the Woods and the United States boundary on the south. Does the map on page 116 show that this is true? This makes Winnipeg an important railway centre, with the largest freight yards in Canada.

In Winnipeg the wheat is sampled and graded. Then it is sent on by train to Fort

William and Port Arthur, where there are some of the largest grain elevators in the world. (See the picture on page 97.) These serve to transfer the wheat to waiting freighters, or to store it for future shipment. Some grain moves east by train, especially during the winter when the lakes are frozen over. Most of it goes by boat: to the many ports on the Great Lakes; to Montreal and other St. Lawrence ports; by the St. Lawrence Seaway to countries overseas; or by way of Buffalo to New York.

Of course, not all the wheat is exported. At Winnipeg, and in fact in all the larger cities of the prairies as well as at the chief ports along the Great Lakes and St. Lawrence River, there are flour mills. These grind flour not only for the needs of our people, but also for export. Several cities have factories in which breakfast foods are made. After hearing all this about the importance of Canadian wheat, you will not be surprised to learn that Canada is one of the great wheat-exporting countries in the world.

On the map on this page find where the wheat is grown. Which province has the greatest area in wheat? Which has the smallest? Notice the wheat-growing area in the northwestern part of Alberta. This is the Peace River District. This region is far north for wheat, yet the quality of the grain grown there is very high. Which ports are nearest for export purposes?

SOME THINGS TO DO • 1. On a large sheet of brown paper or cardboard make an advertisement telling English millers (a) why they should buy Canadian wheat; (b) where it is grown; (c) the ports from which it is shipped; (d) the routes that the wheat follows to reach each of these ports.

2. Write in your own words the story of the work done by a wheat farmer in Saskatchewan from the time that the snow melts in the spring until the "freeze up" in the fall.

3. Ask your teacher to help you find the



The lands where wheat is grown in Canada. In which province is it grown farthest north?

story of Dr. William Saunders and his son Charles, the clever scientists who developed a kind of wheat that would ripen fast enough to permit its being grown on the Canadian prairies.

4. Debate the subject: "Resolved that it is better to be a wheat farmer in Saskatchewan than a fruit farmer in the Annapolis Valley."

5. Find out how wheat is ground into flour.

6. From your health book learn the importance of the wheat germ to health.

7. Look at the packages of breakfast food that you use in your home. Were any of these foods prepared in the Prairie Provinces? If so, where?

A wheat field with elevators in the background. Where do you think the railway is?

Courtesy of Canadian National Railways





**Irrigation projects
in western Canada.**

OTHER KINDS OF FARMING

Other crops • Although wheat is the most important crop on the prairies, it is by no means the only crop grown. As time goes on, more and more farmers are raising other crops, so that they will not be ruined if their wheat crop fails or if they cannot sell their grain. Reread pages 130-133 to find ways in which the wheat crop may be ruined.

Oats, barley, and flax are the other crops most commonly grown in addition to wheat. Flax is the plant from whose fibres linen is made, but the flax in western Canada is grown not for its fibre but for its seeds. In mills the seeds are crushed to press out the oil. This oil, called *linseed oil*, is used in making paints, varnishes, and linoleum. The mash that remains after the oil is removed from the flax seeds is made into cakes and dried, then ground into meal for cattle feed.

Mixed farming • Turn to the map on page 188. Find the grain-growing regions of the Prairie Provinces. Now find the mixed-farming region which curves around the northern border of the grain lands. Do not miss the mixed-farming region of the Peace River District. These parts of the Prairie Provinces are often spoken of as *parklands*, since trees are found as well as grasses. They are pleasant regions, less likely than the true prairies to suffer *drought*, or the lack of rain.

In this region farming is carried on more as it is in eastern Canada, but with several differences. As a rule, farms are larger here and more space is used for grains — oats, some wheat, barley, and rye. Potatoes are

grown, but there are fewer vegetables than in the East. Very little corn is raised, as the growing season is too short and the nights are too cool. Sunflowers, and oats which are cut green, are chopped up and used instead of corn for winter feed. Animals need green fodder for vitamins, just as people need salad greens.

Food for the cities • Around the cities and larger towns, there are dairy farms which provide fresh milk for the city people. Some of the best land is used for market gardens.

The dry lands • From the maps on page 129, we learn that farming cannot be carried on everywhere in the Prairie Provinces. A large part of the southwestern section is too dry for crops unless extra water is supplied. Even where it is possible, the farmer must be careful to choose a crop that is suited to the soil and the climate.

Irrigated lands • Look at the map above showing the location of the irrigated lands of western Canada. Which province has the greatest area under irrigation? Find and name the rivers on which these irrigated districts depend for water. Which of the Prairie Provinces lacks irrigation? Turn to the second map on page 129 to discover why this should be so.

A visit to an irrigated district. We were fortunate in finding a government inspector who was driving from Medicine Hat to Lethbridge. This is what he told us on the way.

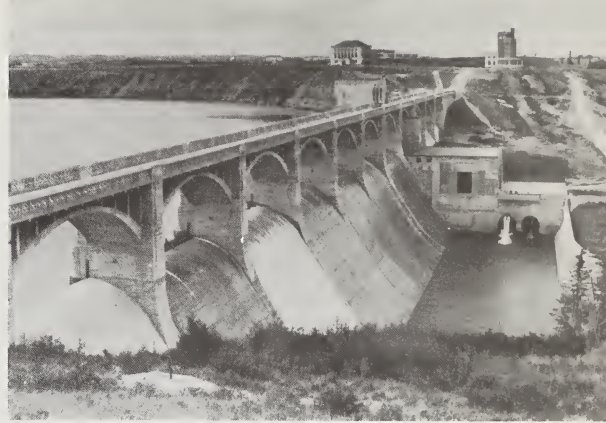
"You can see for yourselves as we go how thin and poor the grass is, and how the bare

ground shows through where there is no irrigation. Where this land was ploughed to raise wheat, the crops after a few years failed for lack of rain. Then the ploughed-up soil, which was as fine as dust, blew away, and many farmers were forced to leave. We replanted large areas to grass and in time this land should be good for ranching, if too many animals are not kept on it.

"Now look over there at the beautiful green fields stretching for miles. These are our pride. Alberta is fortunate in having rivers which are fed by water from melted snow and ice on the slopes of the Rocky Mountains. To keep water from running off during the spring and early summer, dams have been built to control the flow of some rivers. The water behind the dams is held back in reservoirs until it is needed. At some of the dams a power house has been built to provide electricity for homes and industry.

"Take a good look at these fields. Notice the ditches and canals which carry water to the crops. This land is almost perfect for irrigation. It is almost flat, dropping gently to allow the water to run slowly from the farm irrigation ditches across the fields.

"Saskatchewan is not so lucky as Alberta when it comes to irrigation. There are not so many rivers, for one thing, and there is little water from melted snow. The land is



Canadian Pacific Railway Photograph

An irrigation and power dam near Calgary. Notice that most of the gates that control the flow of water are closed.

very flat, with little slope, and the rivers have cut down their channels well below the level of the fields. All the same, there are a few irrigated districts, and we hope for more. In some places we have tried reservoirs, called *dug-outs*. A deep hole or pond is dug out on many farms in a place where rain and water from melted snow will collect in it during the spring. A fence is built around the dug-out to keep out the farm animals. Pumps raise the water to the level of the fields. A good reservoir will keep a family, their animals, and their crops through a dry summer.

"Now while you have been driving through

Alberta Government Photograph

A field of sugar beets in southern Alberta. Notice the irrigation ditches.





National Film Board Photograph

This ranch in southern Saskatchewan is so large that a plane is used to check the condition of the pasture and fences and the location of the cattle. What is the purpose of the windmill?

these irrigated fields, what crops have you seen? Beets — yes, they are sugar beets, you know. There are many of them. They are made into sugar, and the mash that is left over is used for cattle feed and fertilizer. Vegetables — yes, there are several kinds, including peas and corn. Over there is a factory where many of these are canned. Hay and clover — yes, they are used to fatten cattle brought in from the ranches. Bees are also kept to gather honey from the clover, and honey is being produced in increasing amounts. Some of it is exported. Did you notice the fields of flowers that we passed a mile or so back? They are grown for their seed. The seeds are sorted, cleaned, packaged and shipped to seed houses in many parts of Canada.

“Of course, irrigation is only beginning here. Given water, we can grow almost any crop suited to this part of the world, and with the snows of the Rockies behind us here in Alberta, the water is there for the taking.”

A QUESTION TO ANSWER • Why is irrigation carried on easily in Alberta, with difficulty in Saskatchewan, and not at all in Manitoba?

Ranching • Turn again to the map on page 188 and find the parts of the Prairie Provinces marked *general livestock*. Turn also to the

second map on page 129. Give one reason why this land is used for grazing, or ranching, as it is often called.

On the ranch lands great herds of cattle and flocks of sheep roam from place to place, feeding on the thin grasses. In summer they spread out all over the range, but in winter the animals are usually kept together where they can be fed if the grasses fail. They are not kept in barns as are animals in the East. What crops from the nearby irrigated lands can be fed to ranch animals in winter?

When the animals are ready for market they are shipped by train or truck to slaughter houses and packing plants such as those in Edmonton, Calgary, Swift Current, Regina, and Winnipeg.

THINGS TO DO • 1. Show that you know the meaning of these terms by using them correctly in sentences:

“Manitoba No. 1 hard”	spring wheat
drill	combine
drought	dug-out

2. Find out from reference books how cattle are cared for on a ranch.

3. Find out when and how sheep are sheared. What is done with the wool?

QUESTIONS TO ANSWER • 1. Why is dairying carried on chiefly near the larger towns and cities?

2. Why is irrigation important in southern Alberta and Saskatchewan?

3. What is the source of most of the sugar used in Alberta? What are the *by-products*, or materials made from the mash that is left over in the manufacture of sugar?

FORESTS AND FISHERIES

Forest resources • We have already read about forests north of the grasslands in the Prairie Provinces. Even Saskatchewan, which has the largest area of true prairie, has also great forests.

These forests have many uses. You will probably think first of lumber. Such things as fence posts, telephone poles, railway ties, and lumber for building, are badly needed on the prairies, where the only trees are those along the streams or those that have been planted in shelter belts. Other forest products include plywood of various kinds, pulp, paper, paperboard, and cartons. There is a large pulp and paper mill on the Winnipeg River in Manitoba, a new pulp mill at Hinton in Alberta, and two mills are being planned in Saskatchewan. Some of the timber is used for fuel.

The forests are useful in still another way.

Trapping is important, and there are still many fur-trading posts, in the northern parts of these provinces. In the past too many trees were cut down, and streams and marshes, where animals like beavers and muskrats made their homes, dried up. Now the provincial governments are working to restore the forests and to protect wildlife in both forests and swamps.

Fisheries • At first it seems strange to think of inland provinces having important fisheries, but on the map on pages 124-125 find Lake Winnipeg, Reindeer Lake, Lac la Ronge, Lake Athabaska, and Lesser Slave Lake. They are most important for their fisheries. Much of the fishing is done through the ice in winter. The fish are brought in to the railway by plane, by truck, or by tractor train, and are shipped frozen to cities in eastern Canada and in the United States. The poorer kinds of fish are sold as food for mink and other animals raised on the many fur farms.

PRAIRIE PLAYGROUNDS

Thousands of summer visitors from eastern Canada and the United States visit the Prairie Provinces each year. To help these

Courtesy of Canadian National Railways

*The mining town of
Lynn Lake, set in
the wilderness of the
Laurentian Upland.
The ore from the
mine is sent to
Fort Saskatchewan
in Alberta
to be refined.*





Maligne Lake in the Canadian Rockies. Notice the sharp peaks of these young, rugged mountains.

visitors, as well as the local people, some of the places with the best scenery have been set aside as national parks. Riding Mountain National Park in Manitoba and Prince Albert National Park in Saskatchewan are well known. Perhaps the most famous of Canada's national parks are Jasper and Banff in Alberta.

MINERALS AND ELECTRIC POWER

Metals • Minerals from which metals are obtained are not common on the prairies, but they are found in the rugged country to the west and north. The most important metals that have been mined so far are gold, copper, zinc, nickel, and uranium. On the map on pages 124-125, find the mining towns of

Flin Flon, Lynn Lake, Thompson, and Uranium City. Notice that all four are in the Laurentian Upland.

Mining can be carried on only where minerals are in the ground and near enough to the surface to make mining them pay. When it is decided to open a mine, a town grows rapidly near the mine site. We should also remember that these minerals can be *exhausted*, or entirely used up. When this happens, the mine is closed down and the people move away, leaving behind a "ghost town." Sometimes the mining machinery, and even most of the buildings in a town, are moved to another mine, where work is just beginning. This was done for both Lynn Lake and Uranium City.

Every year more minerals are discovered. Even yet, though, there are large areas that have not been examined. Perhaps some day one of you may discover great mineral wealth now unknown.

Mineral fuels • In lands with winters as cold as those in the Prairie Provinces, some sort of fuel in large amounts is very necessary. The first settlers on the grasslands used *peat*, or *turf*. (Look up these words in your dictionary.) Settlers in the parklands or the forests farther north cut down trees for fuel.

Later coal was discovered in the *foothills* of the Rockies and in the plains farther east. Alberta has much more than half of all the coal discovered so far in Canada. Saskatchewan, too, has coal, but it is not good quality. There is oil, too, in great quantities in all three of these provinces — enough, it is believed, to supply all the needs of our great country.

Oil does not provide fuel only. It provides

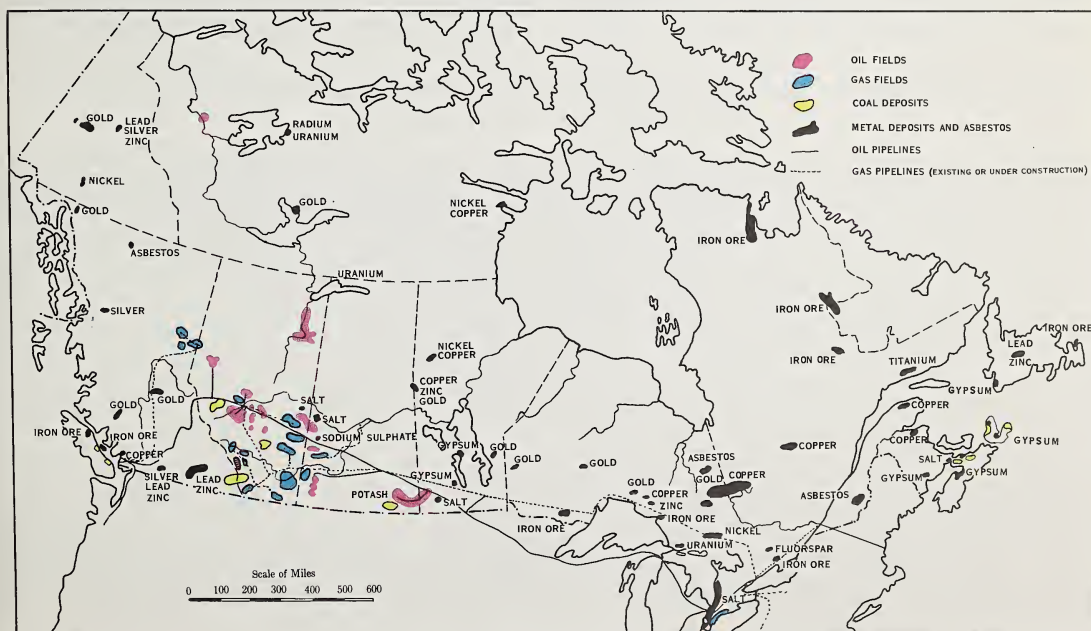
as well power and raw materials for industries. Oil can be delivered cheaply by pipe line to both eastern and western Canada, as well as to the United States. The sale of this oil brings wealth to all three provinces, especially Alberta.

Coal and oil are not the only mineral fuels being developed in these provinces. There are also great quantities of gas in many oil fields. At first the gas was burned as waste. Now the wells are “capped,” and the gas is either stored underground or delivered by pipe line to cities and towns needing fuel for power or industries.

SOMETHING TO FIND OUT • On the mineral map below, locate (1) the coal fields; (2) the oil fields; and (3) the gas fields. Are any of these in the Laurentian Upland?

Drilling for oil. The proper name for oil is *petroleum*, which means “rock oil.” In certain kinds of rock, oil has collected, as water does

The minerals of Canada.



in a sponge. To reach the oil, a deep hole is bored from the surface down to the oil-bearing rock. This is very expensive and needs much machinery. High steel towers, called *oil derricks*, stand up at regular distances in all new oil fields. Find the derricks in the picture below. Under each of these derricks drilling is carried on.

The drill is really a long pipe, with sharp cutters fixed to the end which goes into the ground. A machine at the surface turns the pipe around and around. The turning pipe causes the cutters to turn also, and to bite into the rock. As the drill sinks deeper and deeper it cuts a long tube in the rock. At the surface, lengths of pipe hanging from the tall derrick are joined to the drill as needed, to make it longer. Down and down goes the drill, with the pipes following after it, hundreds, often thousands of feet into the ground. A chemical mixture called "mud" is poured down the hollow pipe. It is forced out by pressure, through the holes in the cutters at the end of the pipe. Then it comes back to the surface through the space between the pipe and the tube that has been drilled.

With it come the pieces of rock and earth which have been cut out by the drill.

Many wells are drilled without reaching oil, but what excitement there is when oil is "struck"! The oil is not allowed to gush out as it used to. A special tap now stops it, so that there is no waste and little danger of fire. The tap is part of a great metal or concrete "cap" which closes the well.

Gas and oil may be found together. When this happens, the gas is usually on top because it is lighter. Pipe lines carry the gas away to be stored or to be sent to towns or cities some distance away. Other pipe lines are laid to carry the oil, either to the main or "trunk" pipe lines or to refineries. On the map on page 141 trace the oil and gas pipe lines from the oil fields to Vancouver on the Pacific and to Sarnia and Toronto in Ontario. Does your home town receive oil or gas from these pipe lines?

Oil refineries and their products. Most cities reached by these pipe lines have refineries where many different kinds of oil, such as gasoline, lubricating oil, fuel oil, and machine oil, are made from the black, crude oil. From

Leduc oil field in Alberta. The refinery is in the centre, an oil derrick to the right, oil tanks at the left, and a grain field in the foreground.

Courtesy of Canadian National Railways



what is left behind, many by-products are made. One of these is sulphur, used in pulp mills. Chemicals and plastics of various kinds are also made.

Other minerals • Other mineral resources of importance in the Prairie Provinces are salt, potash, phosphate, and clay. The first three are used in making chemicals; potash and phosphate are also used for fertilizer; and clay is the raw material for tiles, drain pipes, and pottery.

Electric power • Where there are waterfalls and enough rainfall to keep them running, hydro-electric power can be produced. Alberta and Manitoba are well provided with such power sites — Alberta from the Rocky Mountains, and Manitoba from the rough Laurentian Upland with its thousands of lakes and streams. Many of the best sites are far from where people live, and therefore have not yet been developed. When such power sites are near valuable minerals, they are developed to provide power to run the mines and smelters and to bring light and heat to the buildings of the town.

All three provinces are building hydro-electric power plants. Saskatchewan is not so well provided with water power as the other two provinces, but has plenty of low-grade coal, especially around Estevan in the south-east. This coal is burned to produce steam, which in turn produces electricity. All three provinces are extending their power lines to people in rural areas. Just imagine what it means to lonely farm families to have electricity to light their homes and barns, to run their machinery, and to cook their meals!

TRANSPORTATION

The railways • We know that many of the first railways on the prairies were built to help settlers to reach new farmlands and to ship their crops. Building railways across the level prairies is easy. Once built, however, there is much to do to keep the lines running



National Film Board Photograph

Winnipeg's railway yards are the largest in the Dominion and among the largest in the world.

properly, and the railways give work to many people in the Prairie Provinces.

Locomotives must be kept in good repair. Freight cars, oil tank cars, sleepers, and coaches must be built, kept clean, and repaired. Stations where freight can be loaded and unloaded and where passengers can get on and off the trains must be built and cared for. *Divisional points*, where crews are changed and locomotives checked, are located at convenient places along the line. Telegraph and teletype operators must be on duty day and night on all main lines.

Constant watch must be kept all along the tracks. The worse the weather, the more carefully the trains and their loads must be guarded, for landslides and snowslides in the mountains of Alberta and floods now and then in all three provinces may destroy the railway bed. Even beavers are a nuisance when they are determined to build dams in the *culverts* that carry small streams beneath the railway.

Cities have grown up along the railway

lines in the Prairie Provinces, especially at points where a bridge was built to carry the railway across a river. Some of these railway cities have grown rapidly. Winnipeg now has more than a quarter of the population of Manitoba.

Highways • Although railways are of such importance in the Prairie Provinces, highways are becoming more and more used. The Trans-Canada Highway runs from eastern Canada to Winnipeg, Regina, and Calgary, and on through the mountains. Several excellent roads link up with roadways of the United States. Other roads are pushing northward year by year. One of these connects Grimshaw in Alberta with Hay River on Great Slave Lake. These roads make possible long-distance trucking from Ontario to the Pacific coast and from points in the United States to the prairies, as well as delivery between the cities of the Prairie Provinces.

Airways • Railways brought settlers and business to the prairies, but airways have opened up the north. On the map on page 116, compare the railways with the air lines. Notice that the air routes, like the railways, go out in all directions from such centres as Winnipeg, Regina, Saskatoon, and Edmonton. The routes going northward are some of our pioneer airways. Over them many tons of freight are flown each year, making Canada a world leader in this kind of air transport. Most of this freight goes to northern mining districts and defence posts in large aeroplanes often called "flying box-cars."

By cutting travel time between the Atlantic and Pacific coasts, the Trans-Canada Airlines, commonly called the TCA, have brought our scattered cities nearer together and helped Canadians east and west to understand one another and to work together.

In Saskatchewan, two other uses are made

of planes. Air ambulances have saved many lives, while other planes carry "smoke-jumpers" who parachute down with whatever is needed to fight forest fires.

Tractor-trains and snowmobiles • A tractor-train is made up of a tractor — sometimes two — and a train of covered sleighs carrying freight. A snowmobile has a low body like a small bus. Instead of wheels, it has skis in front and a tractor-like arrangement at the back. Both tractor-trains and snowmobiles operate only on snow or ice. They follow a route over a frozen lake or river or a rough trail through the woods.

MANUFACTURING

A growing industry • Although the Prairie Provinces are still a thinly populated part of Canada, there has been a remarkable increase in the amount and kinds of manufacturing done. What is done still depends on the raw materials produced and the needs of the people. Both of these have changed greatly in recent years. Many goods are now made locally, instead of being brought in from Ontario or the United States.

Meat packing • Meat packing is the most important manufacturing industry in the Prairie Provinces and one of the oldest. Just what does "meat packing" mean? Roughly it means changing an animal into meat ready for sale as food. To get a clearer idea of what meat packing means, a group of boys and girls visited a packing plant in Calgary. This is what they saw and what their guide, Mr. Hicks, told them.

"You boys and girls probably wonder why there are packing plants here in Calgary. The chief reason is that not far from the city there are many cattle — cattle grazing on the dry grasslands and cattle fattening on the irrigated farms around the city. Of course, there are sheep too, and hogs, but most of the meat we produce is beef. The next most important reason for our industry is that



National Film Board Photograph

A packing plant inspector marking a beef carcass to indicate that it satisfies the required standard.

here in Calgary there are many people needing meat. What they cannot eat, we can ship easily to other places, since Calgary is an important railway centre. Railways, with their refrigerator cars, carry the meat west, north, and east in Canada, and south to the United States. But come and see our plant.

"The animals come here from the killing pens. These men you see are *dressing* the meat. This includes everything that is done to an animal after it has been killed, in order to prepare it for sale. Here, for example, the hide is removed."

Farther along in the building the group saw "sides" of beef hanging all clean and fresh-looking. These had been made by splitting the animal down the "fin," as the backbone is called. The two halves, the guide said, were called "sides" of beef. From time to time inspectors examined the meat closely, to make sure that only good meat would be sold.

"All the meat that is satisfactory," Mr. Hicks told the group, "is then graded according to weight and intended use. Finally it is marked with the familiar red or blue stamp



National Film Board Photograph

Federal government graders marking grades of beef in red or blue with their stamping hammers.

which shows its quality, and is left to hang overnight.

"Chilling the fresh sides of beef is the last important part of the work here," continued the guide, as he led the group to the doors of the refrigerating room. "Tomorrow the sides that you have seen will be moved on to this 'holding cooler,' where they will remain until sold."

When the heavy door was opened, the boys and girls understood that the "cooler" was really cold — just a few degrees above freezing. Bright lights sparkled on the frost-covered pipes. In neat rows hung the sides of beef and lamb, almost as white as the frost itself. Everything was spotlessly clean, and the floor was covered with smoothly raked sawdust.

"These sides of beef and lamb are not the only products of meat packing," Mr. Hicks told the group. "Very little of the animals is wasted. The livers, kidneys, tongues, and brains are sold for food. The wool goes to the textile industry, the hides can be turned into leather. Margarine and tallow are made from the fat, medicines are made from some of the



Imperial Oil Limited

A refinery at Regina. Study the map on page 141 to discover where the crude oil comes from.

glands, gelatin and glue are produced from the hoofs and horns, and the rest, including the blood and bones, goes into canned dog-food, feed for fur-farm animals or poultry, and fertilizer."

Outside the cooler again, someone asked why they had seen no pork. "Pork receives rather different treatment," the guide explained, "and little is packed here."

As the girls and boys thanked Mr. Hicks, they told him that in future they would realize better how much care is taken to make meat both safe and appetizing.

Flour milling • Flour milling, which used to be the first industry of the Prairie Provinces,

now ranks third. Both meat packing and oil refining, with the industries which depend on them, are now more valuable. All the same, flour milling is important, and mills are found in all the cities where wheat is unloaded.

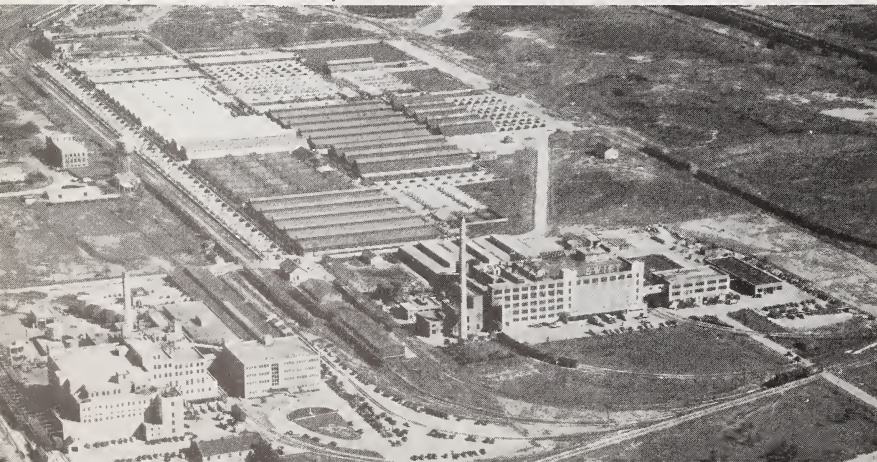
Oil refining and its by-products • You have already read of the work of the great refineries in cities near the oil fields or along the various pipe lines. You have also read of the chemicals which are made near the oil refineries. As time goes on, more by-products will be made to provide the materials for other industries. Some of the finished products which depend on oil refining are sulphur for the pulp industry, synthetic materials for the clothing industry, plaster-board for the building industry, and plastics for many kinds of industries.

Other manufacturing • Tanning and the making of leather goods are also important. Hides and skins from the cattle and sheep are the raw materials for leather manufacturing, and tanning is the work done to the hides and skins to make them into leather. In some of the cities, clothing, shoes, furniture, and other household goods are made.

Manufacturing centres • Each of the important railway cities of which we have read has also become a manufacturing centre.

Winnipeg. The most important city is Winnipeg, with a population of over a quarter of a million. It supplies goods for

Courtesy of Canadian National Railways



Stock yards and meat-packing plants at St. Boniface.

many of the small towns of the West, partly through large mail-order houses. At one time most of the goods needed west of the Great Lakes were manufactured or assembled in Winnipeg, or were shipped from the East by railway through Winnipeg. For this reason the city is called a *distributing centre*.

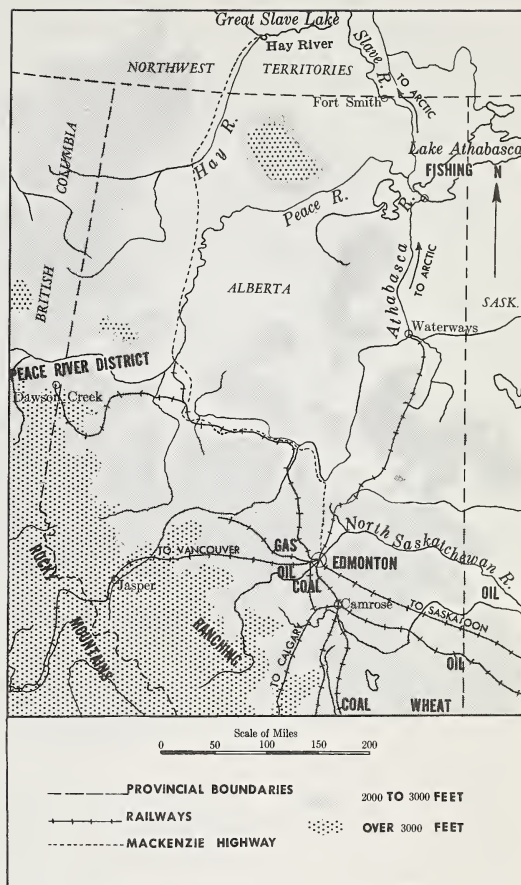
Find Winnipeg in the index, and turn to the pages where it is mentioned. In your notebook list the industries that you find. To your list add the following: fish processing, printing and publishing, and the making of cement, steel pipes, chemicals, electrical machinery, *rolling stock* (which means box-cars and other cars needed by the railways), automobile parts, clothing, oil refining, and aircraft repairing. Opposite each of these finished products, list the chief raw material from which it is made. In a third column write the name of the place from which this material may come.

Winnipeg is also an important base for equipping many northern mining towns and is the headquarters of the Hudson's Bay Company.

Regina. As you did for Winnipeg, learn what you can about Regina, and write it down in your notebook. The bringing of oil to Regina has provided power for industries and has encouraged many firms to build plants in the city. Some of these make farm machinery, cement, steel pipes, and paper bags of many kinds. Regina has, in addition, two large oil refineries. Like Winnipeg, it is a distributing centre. It is also the home of the Royal Canadian Mounted Police.

Edmonton. The capital of Alberta is one of the most rapidly growing cities in Canada. It has been given several names which tell us something of the reasons for its growth. Some of these are: "Gateway to the North," "Canada's Oil Capital," and "The Cross-roads of the Air." By studying the map on this page let us see what we can learn.

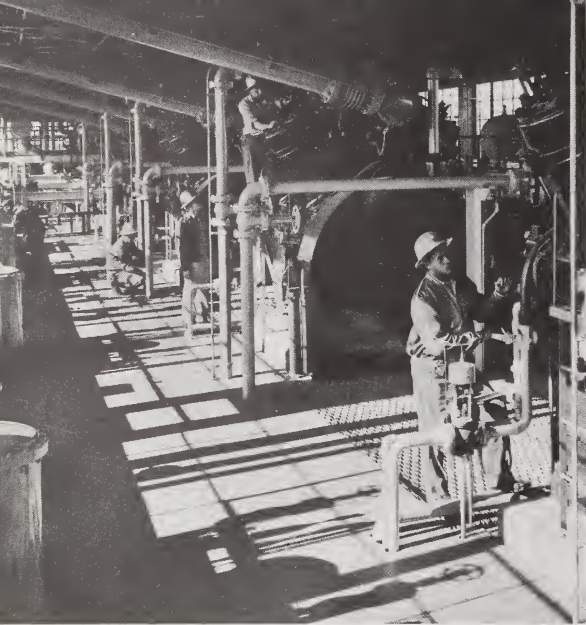
Although the city is over 2000 feet above



Edmonton and the surrounding area.

sea level, it is built on a level plain. This means that there is plenty of room to grow in all directions. In the early days, the North Saskatchewan River provided a ready-made highway. Today it supplies water for the city's many needs.

When you look at a map, the first thing you notice about Edmonton is that railways lead out in all directions. The city is in truth the centre for roads and railways leading towards the Yellowhead Pass and the Pacific; the Arctic; and the Atlantic. Why is this important? It is in Edmonton that machinery and equipment are collected to supply the many mining and oil-producing companies



Courtesy of Canadian Industries Limited

A plant in Edmonton where plastics are made from natural gas.

round about, as well as the farming communities in the Peace River District and the Northwest Territories.

Edmonton is outstanding as a centre for air travel and transportation. Because of this, the city has a large, up-to-date airport, from which planes take off for Alaska, the Canadian North, eastern and western Canada, Europe, and places in the United States. As air travel across the Arctic becomes more common, the importance of Edmonton's airport will increase.

Most important of the advantages on which the growth of the city depends is oil. Not far from the city are some of the largest oil fields in North America. This, of course, leads to oil refining, as well as to the variety of industries depending upon it.

Not far from Edmonton, at Fort Saskatchewan, is a plant where ore brought from Lynn Lake in Manitoba is treated. From this ore come nickel, cobalt, and blister copper, as well as chemicals. The copper is shipped all the way to Montreal East for refining.

THINGS TO DO • 1. Discuss the reasons why Winnipeg has become a large city. Remember that the chief needs of a large city are:

- a. a location in the centre of a rich farming, mining, or other populated area;
- b. a good transportation system, both local and to distant places;
- c. raw products near at hand or cheaply brought in;
- d. plenty of skilled workers;
- e. people enough to buy the goods produced;
- f. plenty of food and drinking water nearby;
- g. plenty of room to grow.

2. Edmonton has one of the largest airports in Canada. Give as many reasons as you can why this should be.

3. Divide your class into four groups, each of which may study one of the following cities: Calgary, Saskatoon, Moose Jaw, and Brandon. By studying maps and reference books try to discover what has led to their growth. Report what you find to your class.

4. Imagine that you have been appointed to show a group of travellers the interesting points of the Prairie Provinces. Where should you take them to see the following?

- a. an important copper mine
- b. crops growing under irrigation
- c. an oil field in production
- d. a popular mountain resort
- e. Saskatchewan's capital city
- f. the greatest railway yards in Canada
- g. a salt-water harbour
- h. a national park

5. Manufacturing in the Prairie Provinces has increased greatly in the last ten years. Give as many reasons as you can why this is so.

BOOKS TO READ • For more information about the Prairie Provinces:

Story of Our Prairie Provinces, by JOSEPH M. SCOTT (Dent)

The Story of Wheat, by DONALD J. DICKIE (Dent)

The Story of Oil, by JOSEPH M. SCOTT (Copp Clark)

Alberta, by M. BELLE RICKER (Copp Clark)

Manitoba, by AGNES FLORENCE (Copp Clark)

Saskatchewan, by D. C. McLEOD (Copp Clark)



Canadian Pacific Railway Photograph

Orchards along the Thompson River near Kamloops. Notice the sparse vegetation on the hillsides.

BRITISH COLUMBIA

In our journey across Canada from east to west, we have come to British Columbia. We have visited the Atlantic Provinces, so largely dependent upon the sea; Quebec, with its great rivers; Ontario, with its great lakes; and the Prairie Provinces, with their wide-spreading grasslands. British Columbia, the most westerly of the provinces, is in many ways the most remarkable of all.

The western coast of British Columbia has the heaviest rainfall in Canada, while part of the southern interior is our country's driest region. British Columbia has the thickest forests and the tallest trees in Canada, yet parts of the province are so dry that trees will not grow. It has regions too high or too dry for farming, but it also has the Peace River District which produces the best wheat and oats in Canada. Victoria, on Vancouver Island, is known the world over as Canada's evergreen playground, while in many places

in the interior of the province the winters are long and bitterly cold, and among the mountains snowfall is heavy. As you study the following pages, try to discover what makes British Columbia such a land of contrasts.

WHEN THE WEST WAS YOUNG

Early explorers • On the map on pages 6-7, notice how the Rocky Mountains shut off British Columbia from the rest of Canada. It should not surprise you to learn that the coast was the first part of western Canada to be explored.

In 1725 Vitus Bering was sent by Russia to discover whether that country was joined to North America. He crossed the North Pacific from Asia, sailed northward along the coast and into the Arctic Sea by way of the strait that now bears his name. He did not, however, come as far south as British Columbia.

He did prove, though, that the two continents of Asia and North America are not joined.

In 1774 the Spaniards sent Juan Perez to explore the coast. He reached the Queen Charlotte Islands and is said to have entered Nootka Sound on the west coast of Vancouver Island. He was thus the discoverer of British Columbia, although he did not land.

In 1778 Captain James Cook, who had earlier mapped the St. Lawrence River for General Wolfe, explored the coast of British Columbia, while trying to find a passage by sea to the North Atlantic. Although he did not find the long-sought-for passage, he did trade with the Indians at Nootka Sound. For a few trinkets he gained thousands of dollars' worth of beautiful sea-otter skins.

Following the voyages of Perez and Cook, both England and Spain claimed what is now British Columbia. They almost went to war over the question, but in the end Spain withdrew its claim.

Captain George Vancouver, who as a boy had sailed with Captain Cook, was sent to take charge of the small settlement the Spaniards had started on Nootka Sound. He sailed around Vancouver Island and for two years explored and mapped the coast.

Fur traders blaze a way overland • When the North-West Company heard of the rich furs to be had along the Pacific coast, they sent out traders to find an overland route. Today a trip across British Columbia in a comfortable railway coach is exciting, as the train runs along the side of deep gorges, plunges into dark tunnels, and crosses high bridges. Imagine what the journey must have been for the men who first made their way through this rugged, unknown country, without the help of maps or guides! Mackenzie was the first to reach the Pacific from the east. Later Fraser and Thompson came by different routes, blazing trails for others to follow. On the map find rivers that bear the names of these last two explorers.

A BOOK OF EXPLORERS • Plan to make a book telling stories about some of the explorers of the Pacific coast. Divide the class into groups. One group may make a map of British Columbia. Other groups may each select an explorer and find out as much as possible about him, then write his story as a chapter for the book. The map group may mark on the map the routes of the various explorers, using a different colour of crayon for each. They may also put in the names of all places mentioned in the stories. Show a key to explain each colour used.

You will find information about these explorers in your history text and such books as: *Builders of the West*, by F. HOWAY (Ryerson) *Mackenzie and His Voyageurs*, by ARTHUR P. WOOLLACOTT (Dent)

The Story of Captain Vancouver, by RODERICK HAIG-BROWN (Macmillan)

The Map-Maker, by K. WOOD (Macmillan)

Ryerson History Readers: Captain George Vancouver; Sir Alexander Mackenzie; David Thompson; Simon Fraser

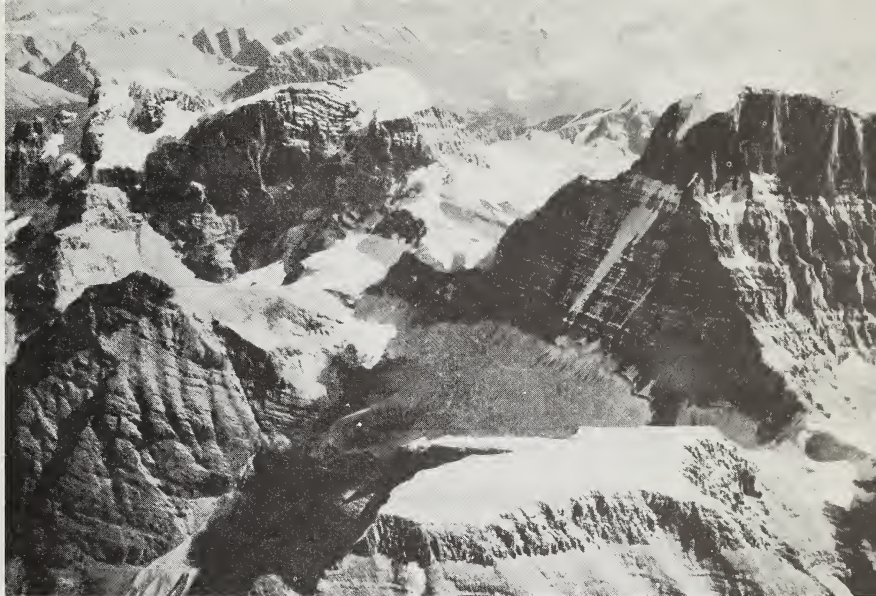
The gold rush • Gold on the Fraser, gold in the Cariboo! The news of the discovery of gold in British Columbia in the eighteen sixties spread quickly. Neither the high mountains nor the rushing rivers stopped the men who came from all parts of the continent in their eagerness to find gold. British Columbia soon became known in many parts of the world.

A link with the east • In 1871 British Columbia became a province of Canada, after the Federal Government had agreed to build a railway to link it with the East. Many people were sure that the "sea of mountains" would block any attempt to build a railway across the province, but men of courage succeeded in finishing the task in 1885.

A VARIETY OF LANDFORMS

The eastern mountains • Beginning at the east of the province, we find ourselves among the Rocky Mountains — the highest range in Canada. Many of these mountains are so

A sea of mountains.
Can you see
the layers of rocks
in the mountain sides?



Courtesy of Canadian National Railways

high that their tops are covered with snow the year round. Notice on the maps on pages 156-157 and 192 that the Rockies run in a general northwest-southeast direction and continue across the border into the United States. Three chief passes pierce this mountain wall: the Yellowhead in the north, the Kicking Horse, and the Crowsnest farther south. Through these passes stream the trains, trucks, buses, and automobiles carrying passengers and freight back and forth between British Columbia and the rest of Canada.

In the southern part of the province the summits of the Rockies form the boundary between Alberta and British Columbia. To the east of this line, rivers flow across the Prairie Provinces and their waters in time reach the Arctic Sea or Hudson Bay. To the west of this line or *divide*, the rivers cross British Columbia on their way to the Pacific Ocean.

A rolling plain • The northeastern part of the province, east of the Rockies, is not mountainous but forms a high rolling plain, into which three rivers — the Peace, the Fort Nelson, and the Liard — have cut deep

valleys. Find these rivers and trace the course their waters follow to reach the sea. Part of this plain is the famous Peace River District.

The Rocky Mountain Trench • West of the Rockies is a deep valley or *trench*. In this trench rise the headwaters of the Columbia and Fraser rivers which drain into the Pacific Ocean, and those of the Peace River whose waters reach the Arctic Sea. Locate these rivers on your map and trace their course to salt water.

The Columbia Mountains • West of the Rocky Mountain Trench are four mountain ranges, three of which lie within the bend of the Columbia River. The best-known of these is the Selkirk Range. Between these ranges are several long narrow lakes, dug out ages ago by a southward-moving ice sheet.

The Interior Plateau • This high, dry region stretches across British Columbia from north to south. Into this plateau, rivers have worn down so deeply that in many places the blocks of plateau that remain look like mountains. In the southeast is the Okanagan Valley which is the most important fruit-growing district of the province. So rough is this plateau region that even yet few roads



The Fraser Canyon. Find the two railways. Why does transportation follow the valley?

and fewer railways cross it. Two main railway lines and the Trans-Canada Highway cling to the walls of the Fraser Canyon, the gateway to the Lower Fraser Valley.

The Lower Fraser Valley • Turn back to page 8 and reread the last two paragraphs. This low, level, well-watered and fertile plain is one of the finest farming regions in Canada, and here most of the people of the province live. At the Pacific end of the valley lies Vancouver, the largest city in British Columbia and our chief western port.

The last barrier • North of the Fraser Valley the way to the coast is blocked by the Coast Range. These mountains form the western

coast of British Columbia and extend southward into the United States and northward into Alaska.

A trip along the coast • Let us take a trip northward from Vancouver to Prince Rupert by way of the Inside Passage. The Inside Passage, we discover, is a long stretch of quiet water between the mountainous mainland and a fringe of islands which are the tops of a chain of sunken mountains. On the mainland a heavily forested mountain wall rises steeply from the water's edge. This coastal wall is broken by many deep narrow valleys called *fjords*. In past ages tongues of ice flowed through these to the ocean. Later

the whole coastal area sank gradually, allowing the ocean waters to fill these valleys for many miles inland. These deep inlets and *sounds*, as they are now called, form excellent harbours. From our steamer we catch glimpses of tiny settlements, of logging camps, fishing fleets, and fish canneries. At Powell River and Ocean Falls we see large pulp and paper mills. Our journey ends at Prince Rupert at the mouth of the Skeena River.

Queen Charlotte and Vancouver islands • These islands, too, are the tops of a partly sunken mountain chain. Vancouver Island, the largest and by far the most important, is separated from the mainland by the Strait of Georgia.

A CHECK-UP • Have you found on the maps on pages 156-157 and 192 all the regions and the rivers of British Columbia? Study the cross section on page 154. One region, being too far north, is not shown. Another is shown, but not named. Which are these?

A MAP EXERCISE • On an outline map of British Columbia, show the chief mountain ranges by shading. Print in the names of the ranges. In their proper places print the names "Vancouver Island" and "Rocky Mountain Trench," also the names of the chief rivers and valleys. Mark in blue the main lines of the



British Columbia Government Photograph

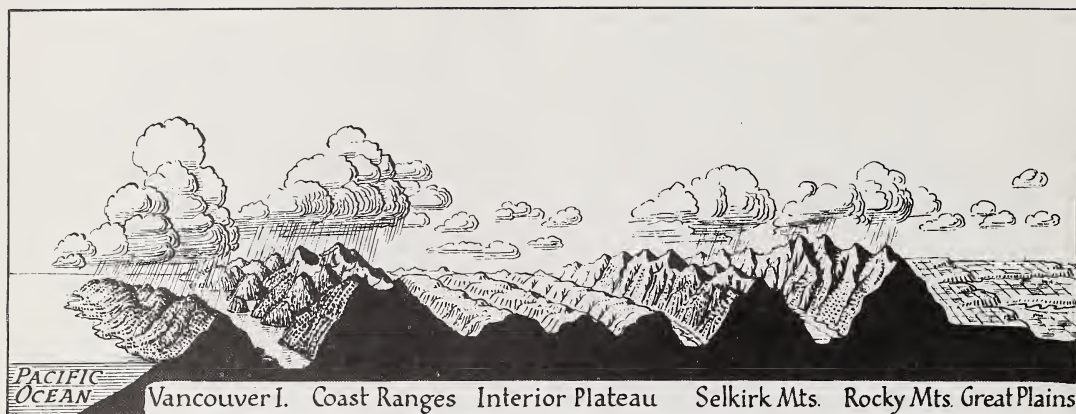
Fishing boats at Prince Rupert. Notice the mist and low clouds over the mountains.

Canadian Pacific Railway, in red the main lines of the Canadian National Railways, and in yellow the Pacific Great Eastern Railway. Print in the names of the three passes through which these railways cross the Rockies, and the names of the two chief ports, Vancouver and Prince Rupert. As you do this work, you will need to refer to the map on pages 156-157 and to the map on page 116 showing railways.

Courtesy of Canadian National Railways

*Sailing along
the Inside Passage
on the way
from Vancouver
to Prince Rupert.*





A profile, or cross section, of the land forms of British Columbia from west to east. A study of it will help you to understand the relation between climate and land forms.

CLIMATE AND VEGETATION

Climate and Winds

How do the climate and the landforms about which we have just read unite to make British Columbia a land of contrasts?

British Columbia lies in a part of the world where the *prevailing*, or most frequent, winds blow from the western ocean. These winds, known as the *prevailing westerlies*, carry much moisture. How does this affect the climate of the coast? Look carefully at the diagram of British Columbia on this page as you read the following paragraphs.

Oceanic climate of the coast • The prevailing winds blow in from the sea and carry a heavy load of moisture. This affects greatly the climate of the coastal regions. You may wonder why this is so.

Water and land do not heat and cool at the same rate. Where the sun shines brightly on a land surface, the land heats quickly and it, in turn, heats the air above it. A large body of water heats much more slowly, which helps to explain why people flock to the seashore or lakeshore during hot weather.

When winter comes, bringing short days and a sun always low in the sky, the land cools quickly. On the other hand, the water

bodies that heated so slowly during the summer now cool just as slowly, so that the air above them is warmer than the air above the land.

It is the slow heating and cooling of the great body of water known as the Pacific Ocean that gives the coast of British Columbia its delightfully *temperate climate* with mild winters and cool summers.

When warm, moist air is carried from the sea toward the land by the prevailing wind, it must climb the colder mountain slopes. As it rises it is cooled, and the moisture it holds forms into clouds. As more and more moisture collects in the clouds, heavy rain falls. Although rain may fall at any time during the year, it is heaviest during the winter. Fogs are common along the coast during the summer as the cool moist air drifts in from the sea.

The total yearly rainfall on the west coast of Vancouver Island is very high. On the other side of the island, especially in the southeast, the rainfall is much less. Only 27 inches of rain a year falls at Victoria. In the summer, irrigation of some sort is needed for the flowers and fruit that grow so well during the long sunny days.

On the west coast of the mainland also,

rainfall is heavy. In several places it is over 150 inches for the year. This includes the snow which falls on the higher levels.

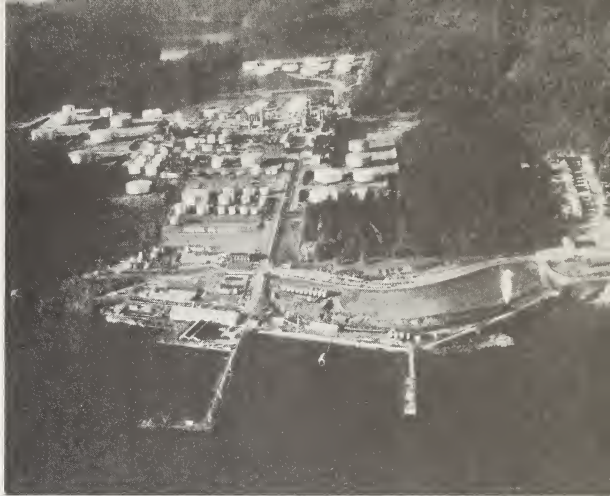
Because of the heavy rainfall, the forests of the west coast are very thick. Many trees are of great size and age.

The dry climate of the interior • The westerly winds which lost most of their moisture on the way up the western slopes of the Coast Range now move down the eastern slopes. As more and more of this dry air slides downward, it grows warmer and takes up, or *evaporates*, moisture from the region over which it blows. This means that little rain falls — in some places in the south only 7 to 10 inches in a whole year.

When air is dry, the sun shines through it easily, the sky is a deep blue, and the summer days are very hot. When the sun goes down, the dry air cools rapidly, because air with little moisture allows the heat from the earth to escape through it. In winter, on the other hand, when there is little heat from the sun, both the days and nights are very cold. The clear skies and dry air, the hot summers and cold winters of the interior are very different from the moist air and the temperate summer and winter climate of the Pacific coast.

The difference in climate causes a difference in vegetation. Instead of the dense forests and enormous trees of the coast, the trees of the interior are thinner and not so close together, while in places there are no trees at all, but dry grasses and plants such as are found in desert places.

Another climb • As the winds, moving eastward, reach the west slopes of the Columbia Ranges, they are again forced upward and chilled, causing more rain. Since the air has less moisture to lose, there is less rain than along the coast; but there is enough for the growth of large trees. Once over the mountains the air again slides downhill, this time into the deep Rocky Mountain Trench. Here again the air is dry and rainfall is light.



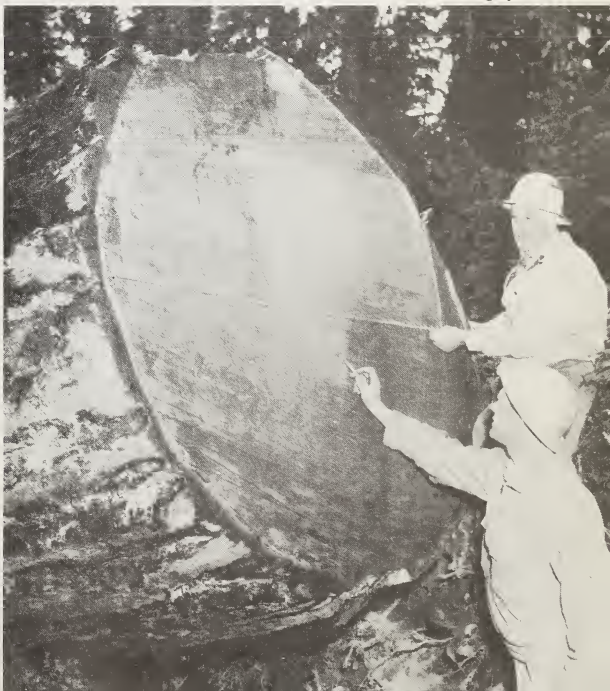
Imperial Oil Limited

Oil refinery near Vancouver, with the dense forest of the West Coast in the background.

Over the last barrier • Now the winds force the air up and over the highest barrier of all — the Rocky Mountains. Again the air is chilled in rising, again clouds form and rain or snow falls, and again we find forests on the westward slopes. When the air slides

Counting growth rings of an eight-hundred-year-old Douglas fir.

National Film Board Photograph









Courtesy of Canadian National Railways

A winter scene on a hillside in southwestern Alberta before the arrival of a chinook.



Courtesy of Canadian National Railways

After the chinook. The trail in the centre was packed too hard for a single chinook to melt.

down the eastern slopes, toward the prairies, it has very little moisture left.

The prairies have colder winters than the interior of British Columbia. Their prevailing winds are from the northwest where there is no mountain barrier to serve as protection from arctic winds sweeping up the Mackenzie Valley. As a result, the cold prairie air east of the Rockies acts as a blanket over which the warmer air from the west flows. Sometimes, however, the warm air from British Columbia finds an opening in the cold air blanket. It then streams down over Alberta and western Saskatchewan, causing a "warm spell." The warm west wind which brings this sudden change is known as the *chinook*. It is sometimes called a "snow-eater." Look at the two pictures above. They explain why this is a good name.

Something worth remembering • Mountain slopes facing the prevailing winds are called *windward slopes*. The opposite slopes are spoken of as the *leeward slopes*. Is the following statement true? If so, remember it. "Windward mountain slopes in British Columbia

have a heavy rainfall." You will find that this is true in many other parts of the world.

LUMBERING

British Columbia's chief industry • The two great resources of British Columbia are lumber from the land and fish from the sea. The province leads all Canada in lumbering and fishing, but from farms, mines, and factories is coming an increasing amount of wealth.

You have already read that the west coasts of mainland British Columbia and Vancouver Island have the heavy rainfall necessary for the growth of large trees. It is not surprising then to learn that British Columbia leads all the provinces in the amount of sawn lumber produced.

Different trees for different purposes • The most famous tree of the west coast is the giant Douglas fir, which often grows to be 250 feet high. Its wood is prized for masts of ships, for heavy timber, and for wharves. Other trees are important too. The red cedar is used largely for shingles and for building canoes and boats. The Sitka spruce, which grows

farther inland, makes fine lumber and is valuable where a strong wood of light weight is needed. The Western hemlock makes strong lumber for construction work. Plywood and veneer for various purposes are made from fir, birch, spruce, and poplar.

Government care of the forests • Within recent years the Government of British Columbia has taken steps to preserve the forests of the province. Rules have been made for lumbering, which all lumber companies must obey. Only trees of a certain size may be cut, and of these enough must be left so that there will always be a "harvest" of good trees. Because of this, logging camps and sawmills no longer need to be moved from place to place. Tree nurseries have been set up to provide seedlings for setting out where fires or over-cutting have ruined the forest. Research stations experiment to find ways of using wood and wood products more widely and for fighting the many insects which damage the trees.

From the forest to the mill • If Joe Le Blanc from New Brunswick were to visit a lumber camp in western British Columbia, he would find much to surprise him. For one thing he would wonder at the size of the trees, then at the way they are moved about. With little or no snow, and most rivers too swift for floating logs, the business of moving the logs is different. Sometimes they are hauled out of the woods on trucks. Sometimes, when the logs are very large, they are dragged out by tractor. Some lumber companies have their own railway to take out the logs. In all these cases heavy machinery is used to lift and pile the logs. Where the logs must cross a deep gorge or very rough ground, a *sky-line* is used. In the picture opposite, look at the cables. They are fastened to two tall trees, called *spar trees*, several hundred yards apart.

By one means or another the logs are hauled to the mill. If the mill is some distance away, the logs are taken to the



British Columbia Government Photograph

Logging on Vancouver Island. Notice the height and size of the trees.

coast. There they are gathered into rafts or booms which are towed to the mill by tugs. Moving heavy loads by water is cheaper than by road or rail, and here the sea is open the year round.

A few sawmills are scattered along the coast, but more and more logs are being sent to the chief saw-milling centres at Vancouver, New Westminster, and Nanaimo. Most of the lumber is exported. It goes to countries

Getting logs down the side of a mountain by the sky-line method.

National Film Board Photograph



all over the world, but chiefly to the United States.

Lumbering in the interior • Although much more than three-quarters of all the lumber cut in British Columbia comes from Vancouver Island and the west coast of the mainland, much cutting and saw-milling is also done in the interior. On the windward mountain slopes, and wherever there is enough moisture in the soil, trees are found. Lumbering here does not need as much heavy machinery as on the west coast, because the trees are smaller and more scattered. The sawmill products are used to supply local needs, but much lumber is also shipped to the Prairie Provinces and to the United States.

Pulp and paper mills • These are increasing in number, both on the west coast of the mainland and on Vancouver Island. In both places there is plenty of clear, fresh water to wash the pulp. In many cases hydro-electric power is used to run the mills. Other mills burn sawdust or other waste from the sawmills to provide power. The largest mills are at Powell River, Ocean Falls, Woodfibre, and Port Alberni. Newsprint and kraft paper

for boxes, bags, and cartons are made. Near Prince Rupert a plant produces the kind of pulp from which rayon is made. Most of the products are exported, either directly from the mills' own wharves or from Vancouver.

A true story • One day Tom Davidson and Nick Pasha were to visit a local sawmill at noon, then report on it to the class. That afternoon the two boys came to school carrying pieces of wood of different shapes and sizes. This is the story they told to the class.

"The saw," began Tom, "is only one of many machines in the mill, although it probably makes the most noise. The *planer*, which smooths the lumber after it is cut, is almost as noisy.

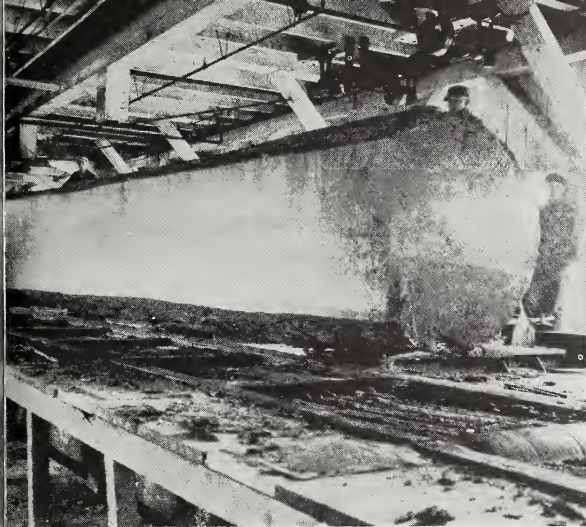
"Beside the mill is a boom of logs, partly in and partly out of the water. A strong sloping bridge leads up from the boom to the mill. A man at the foot of the slope was steering the logs onto the conveyor-belt that carries them up to the mill.

"As each log reached the mill it slid onto a rack which they call a carriage. Then this carriage moved forward, pressing the log against the blade of the spinning circular saw. Moving belts and pulleys seemed to be

British Columbia Government Photograph



**Loading paper
at Powell River.
Would these men
have to work
in the rain
very often?**



Courtesy of Canadian National Railways

A big log going through a sawmill in British Columbia.

everywhere. There was a steady hum and whine of motors, but above all this noise there was an almost deafening shriek as the saw ripped its way from end to end of each log. Then the carriage moved back, and the log was turned onto its flat side. The carriage brought it again, end first, against the saw, which cut off another long slab. This was done twice more, and what was left was no longer a log but a square beam. Some beams are used for building purposes, but those we saw were being cut into boards, some two inches thick, some only one inch. The slabs that had been cut off were turned into thin strips called *lath*. Here are some pieces of lath that they gave us to show you. Nick will tell you what we saw in the next building."

"In the next building," said Nick, holding up a piece of finished lumber, "we saw the planer. The planer shaves off all roughness from the boards. Feel this yourselves, and see how smooth it is. You don't need to be afraid of splinters. They call this *dressed lumber*."

"Some of the sawdust, slabs, bark, and shavings are used at the mill to heat the boilers. The steam from the boilers produces electricity that drives the saws and other

machines. Whatever sawdust and cuttings are not needed in the mill are sold to heat our homes or to fire the boilers in pulp mills."

Then Tom once more took up the story. "Outside the mill we watched the lumber being piled in great stacks. It was fun to watch the little tractors pick up a pile of boards, lift them straight up into the air, and drop them on the top of a pile. There men placed them to dry, taking great care to leave air spaces between them."

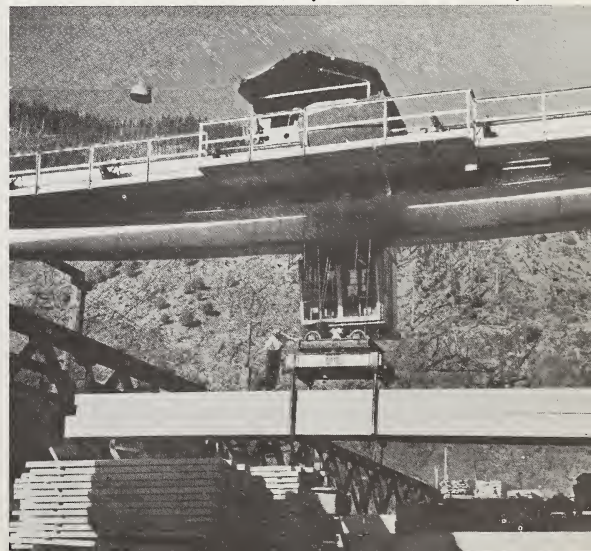
"The boss of the lumber yard told us that we must all learn to care for our forests, just as you told us the other day, Miss McLeod. He explained that trees are a crop, just like apples or tomatoes. He said, too, that just so much wood can grow each year, and if we cut more than is grown, soon nothing will be left. He told us a lot more. We must keep planting young trees and protect them from insects and disease. This should make certain that we have fine forests for all time."

"You are forgetting about forest fires," broke in Nick. "A fire can destroy in no time trees that have taken years to grow."

Miss McLeod thanked the boys for their report and suggested that the class make

A travelling crane moves a load of dressed lumber in a British Columbia lumber yard.

Courtesy of Canadian National Railways



some posters telling about forest conservation. These are some of the rules that were shown on the posters:

1. Protect trees from fires, insects, and disease.
2. Choose carefully the trees to be cut, so that those left will grow into fine timber.
3. Cut no more trees than can be replaced each year.
4. Plant young trees as old trees are cut.

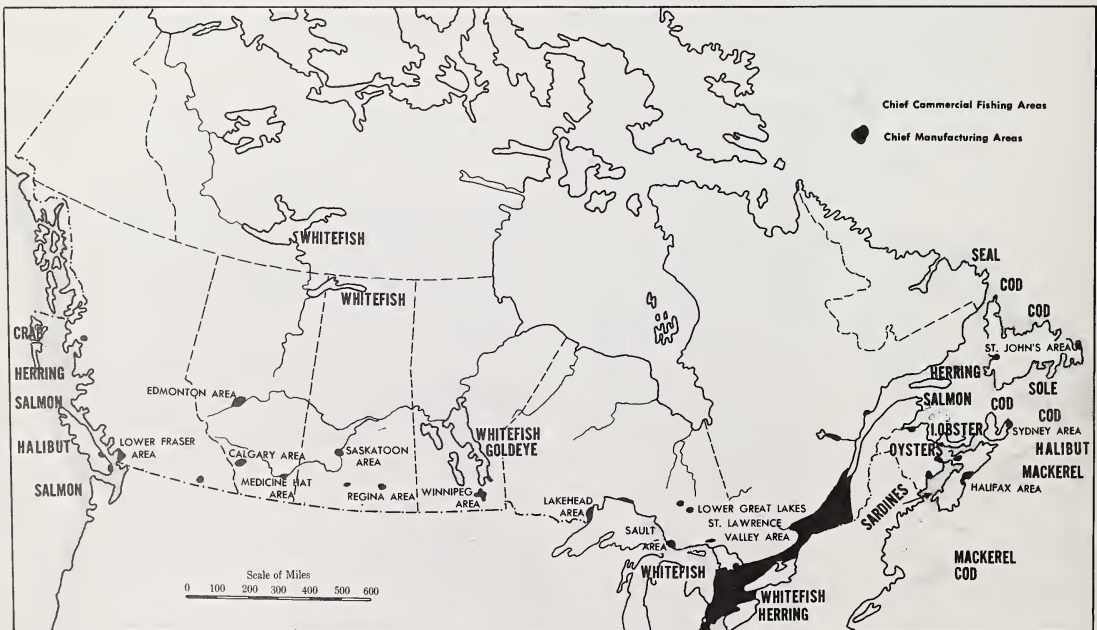
FISHING

Valuable fisheries • In most recent years the value of fish caught in British Columbia was greater than that in Nova Scotia, New Brunswick, and Prince Edward Island together. When you remember how important fishing is to these Atlantic Provinces, you will have a good idea of the value of the industry in British Columbia. In the waters of the west coast are cod, herring, and other fish, but it is for salmon and halibut that they are best known.

Salmon • The life of the salmon is very strange. The baby salmon, or *fingerlings*, hatch from eggs laid in the quiet waters of a lake or pool far inland. After a year or two in a river or lake, the young salmon swims down to the open ocean. At the end of three or four years, the salmon, now full-grown, returns to the same river and the same pool where it was hatched. This is one of the wonders of Nature. No one knows how the salmon finds its way. Not only does it find the same river, but it swims upstream, fighting against strong currents and leaping up high falls, to reach the pool from which it came. There, in clean sand, the mother salmon lays her eggs. Then she and her mate die, for their lifework has been finished.

There are many kinds of salmon, of different sizes, shapes, and colours, but all are good to eat. Some are caught in nets in the ocean or near the mouth of rivers. Many more are caught as they are moving upstream to lay their eggs. Canada has laws to protect

Manufacturing and fishing in Canada.



the salmon, which may be caught only at certain seasons and in certain ways. Hatcheries have been built to supply young fish to rivers and pools. *Fish ladders*, too, have been built by the International Salmon Fishing Commission, to help the salmon pass falls and the increasing number of dams on their way to their native pools. The Fraser is said to be the greatest salmon river in the world. It is the home of the *sockeye*, the finest salmon.

Processing the salmon. Some salmon are salted, smoked, or dried. Many are quick-frozen and shipped away in refrigerated cars to other parts of Canada or to the United States. By far the greatest number are canned and shipped all over the world.

Because machinery used in modern canneries is expensive, canneries are few and large. Most of them are near Vancouver or other port cities, where workers are many and export easy. Fast boats collect the catch from the fishing boats and carry the fish, packed in ice, to the canneries. There the salmon are held in cold storage until the cannery can use them. This method keeps the cannery busy during most of the year.

In the cannery, much of the work is now done by machinery. The fish are cleaned, washed, cut in pieces, and put into cans. After being inspected, the cans are closed and sent to an oven, or *retort*, where they are cooked under pressure, much as your mother cooks meat in a pressure cooker.

Halibut • The halibut is a peculiar fish. A young halibut looks much like an ordinary fish. As it grows older it changes in a strange manner. It becomes wide and flat, and its left eye gradually moves over to the right side of its head, close to the other eye. The right side of the fish is greyish black, but the left side becomes almost white. The halibut is much larger than the salmon, some weighing up to two hundred pounds.

These fish live on the floor of the ocean, some distance from land, and so they cannot



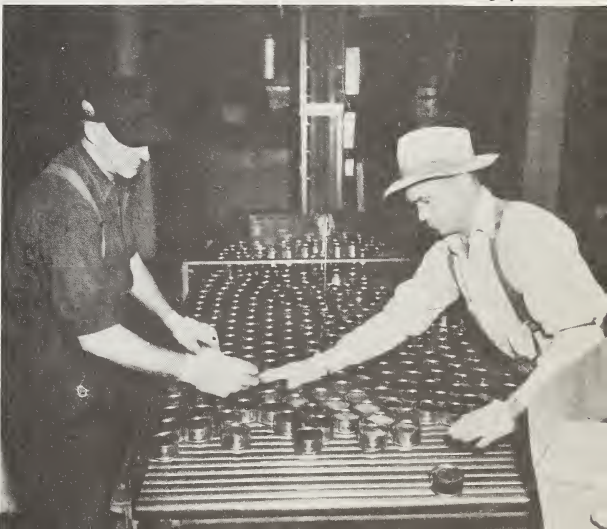
British Columbia Government Photograph

The "tally man" counting fish as they enter a cannery.

be caught in nets. Instead, power boats carrying long lines and many large hooks are used. The lines are let out and reeled in by machinery. The fish are taken from the hooks and packed in ice. When the boat has a full load, it makes for a halibut-export centre. Prince Rupert, with its large cold

Cans of salmon ready for labelling in a British Columbia cannery.

British Columbia Government Photograph





A purse-seiner in the Gulf of Georgia. Notice how the net and floats are being hauled in.

storage plant, is the most important. There the fish are cleaned, and either packed in ice or quick-frozen to be shipped to cities in Canada or the United States. Halibut liver oil, medicines, and fertilizer are made from what used to be waste.

Herring • Herring are surface fish that “run” in *schools*, or great numbers swimming close together. Herring boats use radar to find the schools and nets called *purse seines* to catch the fish. The chief use of the herring is for bait to catch halibut. Some are salted and dried to ship to other countries.

Pilchards, a kind of herring, are caught in

large numbers. From them is produced fine oil, used in making soap, perfume, and varnish. What remains is ground into fertilizer or fish meal to be fed to poultry. Products made from British Columbia pilchards are sent to many lands.

MORE ABOUT BRITISH COLUMBIA'S FISHERIES •

If you would like to know more about the fisheries of British Columbia and the fish caught, these books will help you:

Canada's Pacific Salmon and Harvest of the Waters (The Queen's Printer, Ottawa.)

The Story of British Columbia, by John Gough (Dent). This book also tells about whaling.

MINING

Many minerals • British Columbia ranks next to Ontario and Quebec in the value of minerals produced. Not only are the minerals of great value; there are also many different kinds. Even so, it is likely that much mineral wealth is still undiscovered.

Coal and oil • The first mineral to be mined in British Columbia was coal. It was discovered on Vancouver Island. Since that time large quantities have been mined, chiefly at Nanaimo and Comox. When the Canadian Pacific Railway was built through Crowsnest Pass, coal was found at Fernie and at several other places nearby. This coal was useful as fuel for the railway. It also made fine coke. Coal was found, too, in the Interior Plateau. Since coal is lacking on the west

coast of the United States, much coal from British Columbia has been sent there.

Within recent years oil and gas have been discovered in the Peace River District in the northeastern part of the province. The Trans-Mountain Pipe Line now carries oil to refineries in and near Vancouver. Another pipe line carries gas to the industrial Lower Fraser Valley. Both oil and gas are being exported to the United States.

The coming of oil and gas is changing conditions in British Columbia, as it already has done in the Prairie Provinces. New industries are springing up at places along the pipe lines. Vancouver is growing at a surprising rate.

A less pleasant result is the closing down of many of the coal mines. Diesel locomotives

*The smelter at Trail.
In the foreground is
a chemical plant
which uses the
by-products of
the smelter.*

*What does the
vegetation tell you
about the amount
of precipitation?*





Courtesy of Canadian National Railways

This diesel engine winding its way through the Fraser Canyon burns oil, not coal.

are blowing their whistles among the Rockies and diesel engines use oil, not coal. However, the coal is not being wasted. It will mean wealth for the province in the future. One great need of the west coast of both Canada and the United States is for steel to supply the many growing industries. Good coking coal is one raw material used in making steel. Another is iron, and iron ore is mined on both Texada and Vancouver islands. Steel-making is only *one* possible use for British Columbia's coal. Other uses will be found.

Gold • Gold was first found in British Columbia in the gravel beds of the Fraser River. This is known as *placer gold*. All the early prospectors needed to recover it was a pan and much patience. They "panned out," or washed, the gravel to find the gold. Gold is heavy, and the nuggets sank to the bottom of the pan while the sand and gravel were washed out. Little placer gold now remains.

The greatest gold rush in British Columbia took place farther north in the Cariboo Mountains. Here the gold was far underground and was mined as it is in Ontario and Quebec. This is known as *lode mining*.

Other minerals • In addition to coal, oil, and gold, British Columbia has large quantities of copper, lead, zinc, silver, mercury, and tungsten. If you do not know the uses of these last two minerals, look them up in a dictionary or an encyclopedia. The most famous mine in the province is at Kimberley in the interior. There most of Canada's lead and zinc is produced. The ore is processed nearby and then sent on by railway to the great smelter at Trail. The Kimberley ore produces not only lead and zinc, but silver, tin, sulphur, and several other minerals as well. From the gases and other waste materials, chemicals and fertilizers are made.

Two famous mines on the west coast produce silver, copper, lead, and zinc. In the interior, not far from the United States border, both copper and silver are mined. British Columbia supplies about nine-tenths of the lead and zinc produced in Canada, and the province stands first in the production of silver.

FARMING

A problem to work • Little has been said so far of agriculture in British Columbia. Work out this problem and you will begin to see why this is so. About $\frac{1}{2}$ of the province is made up of bare rock, snow fields, and steep slopes, $\frac{2}{5}$ of forest, and $\frac{1}{20}$ of bodies of water. How much is left for farming?

Regions suitable for farming • The most important farming areas are found in the Lower Fraser Valley, southeastern Vancouver Island, the Peace River District, the irrigated lands of the southern Interior Plateau, and the land along the Canadian National Railways line between Prince George and Prince Rupert. All the fertile land in British Columbia has not yet been put to use. Some is still covered with forest. To clear such land of its great trees is an expensive business, even with the use of heavy machinery.

The Lower Fraser Valley · This is the largest and most fertile area in the province. The land was built up of sediment carried by the Fraser River. In its mad rush through the gorges of the Interior Plateau, the river easily carried a heavy load of sand, gravel, and fine sediment. When it reached the low land near the coast there was little slope and therefore little current. It could no longer carry its load, and so laid it down in the quiet water near its mouth. In time this sediment laid down beneath the sea rose above the surface of the water and became land.

Land formed in this way at the mouth of a river is called a *delta*. Look at the map on this page and you will notice that several peninsulas and islands form a part of the delta. Vancouver's airport is on one of these islands. Another island near New Westminster is being developed as an area for light industries.

All of the Lower Fraser Valley is very low — only about ten feet above sea level. To protect this land from flooding during times of high water, sea walls and dikes have been built. Ditches have been dug to collect the



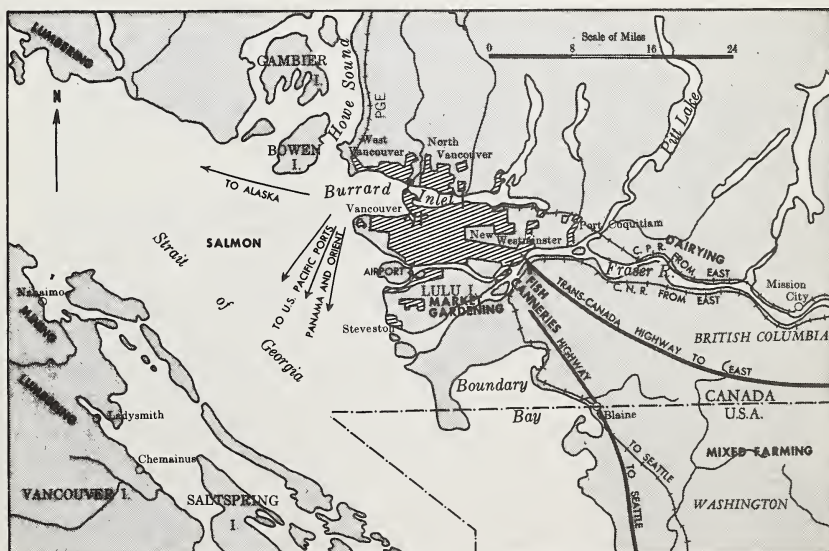
National Film Board Photograph

Chinese farmers picking tomatoes in the vast tomato fields of the Fraser River Valley.

water behind the dikes. It is then drained out during the times of low tide or is pumped out into the sea.

Dairying and market gardening are common in the Fraser Valley. Since about three-quarters of the people of British Columbia live in this southwestern corner of the province, it is easy to understand why vegetables, fruits, milk, and butter are

A map of Vancouver and the surrounding area.



needed in large quantities. Special crops are flower bulbs and seeds, vegetable seeds, holly, and hops.

The farms of this area are small, partly because diked land is expensive. Many are owned and worked by Chinese. The Chinese are skilled farmers and make use of every inch of land. They often raise three crops a year on the same land — first lettuce; then root vegetables; and lastly, cabbages.

Southeastern Vancouver Island • This area has the mildest climate in Canada. It may surprise you though, that during the summer irrigation of some kind is needed for many crops — even for hay for the dairy herds.

The crops raised in southeastern Vancouver Island are much like those of the Fraser Delta. Bulbs, flower seeds, clover seeds, vegetable seeds, including seed potatoes, as well as cut flowers are common. The flowers are shipped by plane to other parts of Canada and to the United States.

Irrigated lands of the southern interior • Along the deeply-cut river valleys and on the benches or terraces around the southern lakes, fruit is a valuable crop. The southern part of the Interior Plateau has very hot summer days. Peaches, pears, and apricots do well there. Farther north, cherries, plums,

and especially apples are raised. Vegetables and alfalfa and other fodder crops are also grown. Hops are an important crop near the United States border. The largest irrigated region is around Okanagan Lake.

The Peace River District • This is the chief grain-growing region of British Columbia. Wheat is the most important crop, but oats and barley are also raised. The grain produced here is of such high quality that it has several times won prizes at international fairs. Cattle, hogs, and poultry are also raised in large numbers. This district has been held back by lack of an outlet to the Pacific. The grain, until recently, had to be shipped by rail to Edmonton. Now the Hart Highway gives an outlet to Prince George and Vancouver, and there is a railway from Prince George to Peace River.

From Prince George to Prince Rupert • This region is still largely one of pioneer farming. Barley and oats are grown as feed for livestock and chickens. Potatoes, hay, and a few vegetables are also produced. As the areas having soil good enough for farming are scattered, and the forest is difficult to clear away, farms are often far apart.

Ranching • In the central part of British Columbia, irrigation is not possible every-

National Film Board Photograph



*Many sheep are
pastured on the drier
lands of southern
interior British
Columbia. These are
near Kamloops.*



Vancouver, with North Vancouver and the harbour in the distance.

where. Rainfall is too light to permit farming to be carried on. These areas are given over to the grazing of cattle and sheep which live on the dry grass that the hot summer sun cures into hay. As cattle need better pastures and more water than sheep, they are kept in the lower pastures near streams or ponds. In summer the sheep are driven to *Alpine meadows* high in the mountains, but return to the ranch pastures for the winter. When snow covers the ground, hay or alfalfa must be provided until the stock can graze again.

CITIES AND INDUSTRIES

A province with growing industries • Even though British Columbia, as a province of Canada, is little more than a hundred years old, it has several growing cities with an increasing

number of industries. In fact, almost half of the people of the province are city-dwellers engaged in industry and trade.

Vancouver • Vancouver is one of the great ports of North America. It is located at the mouth of the Fraser River, and lies nearer to Japan and the other countries of northern Asia than do the western ports of the United States. By way of the Panama Canal grain from western Canada can be shipped cheaply to Europe from Vancouver. Railways, roads, air lines, and steamship lines all meet in Vancouver. It is Canada's western gateway.

The harbour of Vancouver is one of the most beautiful in the world, with the forest-covered slopes and snow-capped peaks of the Coast Range rising behind it. Burrard Inlet is deep enough for the largest ships. The



Canadian Government Travel Bureau

Victoria harbour, with some of the ferries which link the capital city with the mainland.

port, with its warehouses, grain elevators, lumber yards, cold storage plants, oil and sugar refineries, fish canneries, and machinery for loading and unloading, can handle and care for cargoes of many kinds. Since the water of the harbour never freezes over, the port is open the year round.

The city of Vancouver is growing at a surprising rate. It has many large buildings and beautiful parks. On a peninsula overlooking the Strait of Georgia is the University of British Columbia. North of Burrard Inlet

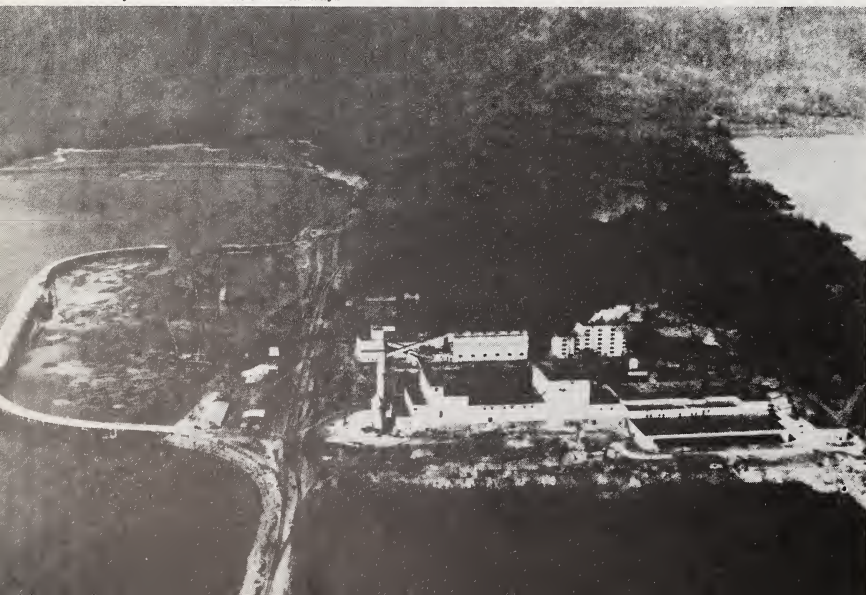
lie North Vancouver and West Vancouver, linked to Vancouver by the Second Narrows and Lion's Gate bridges.

SOMETHING TO DO • Look back through this chapter and list the industries of Vancouver already mentioned. Check your list with the following paragraph, and add any industries you do not already have. Opposite each industry on your list write in two columns (1) the raw material on which the industry depends and (2) the place where this material was probably found.

Some of the chief industries of Vancouver are: lumber milling and the making of wood products; meat packing; ship building and repairing; the making of engines for boats of all sizes, as well as other manufactures of iron and steel; locomotive repairing; flour milling; the making of textiles, clothing, and food products. Since the oil and gas pipe lines were laid, manufacturing of many kinds has increased enormously.

New Westminster • New Westminster is a fresh-water port just east of Vancouver. The Fraser River is deep enough here so that large ships can tie up at its wharves. The city has many industries, those using lumber, paper, and fish being the most important. The Trans-Canada Highway crosses the

Courtesy of Canadian National Railways



This cellulose plant near Prince Rupert uses pulpwood from West Coast forests.

Fraser River at New Westminster. Find it on the map on page 167.

Victoria • Across the Strait of Georgia from Vancouver is Victoria, the capital of the province. It is a beautiful city with many fine homes, hotels, parks, lawns, and gardens. Victoria has often been called "The city of roses," because it has the best climate in Canada for growing these flowers. Because its winters are never very cold and its summers never very hot, many older people come here to enjoy its pleasant climate. The city has a fine harbour and nearby are the Government Buildings.

Although Victoria is not a manufacturing centre like Vancouver, it has a variety of industries: wood-working plants, sawmills, shingle mills, ship yards, and fish canneries.

Esquimalt, to the west of Victoria, is the western headquarters for the Royal Canadian Navy and has large dry docks.

Prince Rupert • This city was built as a western *terminus*, or end, of the Canadian National Railways. As you read on pages 163-164, it is the centre of the halibut fisheries and has a large cold storage plant, as well as grain elevators and lumber yards. Nearby is a mill where cellulose for rayon goods is made from pulpwood.

Kitimat • Kitimat cannot compare in size with Vancouver, Victoria, or Prince Rupert, but it is one of the wonders of our age. The city was built for the one purpose of housing the workers at a great aluminum plant. The ore which supplies the chief raw material for aluminum is *bauxite*. The bauxite upon which the industry at Kitimat depends is mined in Jamaica in the West Indies. Before shipment, it is treated to reduce its bulk. It is then shipped by way of the Panama Canal to Kitimat. There the ships tie up in the deep harbour, while their cargo is carried on conveyor belts to the mill or to storage sheds.

How the hydro-electric power for the aluminum plant is produced is a modern "success story." On the eastern slopes of the Coast Range was a group of lakes. The water from these lakes drained away to the east into the Fraser River. In order to use this water to produce power for Kitimat, it had to be made to flow westward. How was this done?

First a great dam was built to block the eastward flow. Behind the dam the water rose to form a large reservoir. While this was going on, a tunnel ten miles long was cut right through the mountain towards the western side, then down to a power house,

Aluminum Company of Canada, Ltd.

*The aluminum smelter
at Kitimat.*



also cut out of solid rock inside the mountain. When the water in the reservoir rose to the level of the tunnel, it followed the new path westward. When it reached the power house, turbines began to whirl and motors to hum, producing the needed power.

From the power house stretch great cables, strung on aluminum towers for a distance of 48 miles. Over mountains and down into valleys, across deep gorges and through dense forests, these cables carry power to run the mill at Kitimat. The mill is being added to year by year, and as it grows, so does the population of Kitimat.

A pulp mill is planned to make further use of the hydro-electric power and the forests on the mountain slopes. This, too, will help to increase the population of Kitimat.

THE TOURIST TRADE

British Columbia, with its snow-capped mountains, rushing rivers, beautiful lakes, and island-fringed coast, has many attractions for tourists. Some come to study flowers, trees, and birds. Others fish or hunt. Still others enjoy the thrills of mountain-climbing or skiing. Many want only to enjoy a restful vacation in the fresh, clear air.

The government has set aside large areas as parks. Here wild life is protected and the beauties of Nature are preserved for the future. In some parks, trained game wardens explain to visitors the ways of the wild creatures. Some of the parks are near enough to Vancouver and other cities to allow city-dwellers to enjoy them easily.

Visitors from the Prairie Provinces, eastern Canada, and the United States can reach this vacation land in many ways — by train, by plane, by ship, or by car. However they come, they need people to serve them: hotel workers, gas station salesmen and mechanics, railway men, guides, road workers, and many others. The tourist trade is "Big Business" in British Columbia.

THINGS TO DO • 1. At the Panama Canal a record is kept of all cargoes which pass through it. Make a list of those cargoes which might come from British Columbia.

2. Compare the minerals of British Columbia with those of Ontario and Quebec. Which are mined in British Columbia that are not produced in the other two provinces?

QUESTIONS TO ANSWER • 1. Where are the largest trees in British Columbia? Explain why they have grown so tall and straight.

2. During his summer vacation a boy from Kamloops goes to visit his cousin in Port Alberni on Vancouver Island. What will he like, and what will he dislike about the weather? If he went during the Christmas holidays what differences would he notice?

3. Where and why is irrigation necessary in British Columbia?

4. Why are flower seeds, vegetable seeds, and grass seeds suitable crops for southeastern Vancouver Island and the Lower Fraser Valley?

A TRIP TO BRITISH COLUMBIA • Suppose that a family from Winnipeg is spending the summer in British Columbia. Plan their trip for them. Draw a map, and on it show the route which they will follow from Winnipeg to British Columbia and the places where they will stop. The father is a wheat dealer. Where should you send him to see the finest wheat? The mother wants to visit relatives in Vancouver. The brother and sister in the family decide to take turns keeping a diary to send to their friends at home. Each member of your class might write up the diary for one day. Be sure to describe those things that would be interesting to strangers.

THE STORY OF A SALMON • Try writing the story of a salmon from the egg to the dinner table. In your story you might introduce the term "fish ladder." Find out what it means and how the salmon use it.

BOOKS TO READ • For more information about British Columbia:

The Story of British Columbia, by J. M. GOUGH (Dent)

The Story of Canada's Coastal Fisheries, by MYRA C. VERNON (Copp Clark)

British Columbia, by F. C. BOYES (Copp Clark)



VII • Canada's Northland

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Uranium mine at Port Radium on the shore of Great Bear Lake. Notice how small the trees are here as compared with those on Vancouver Island.

THE NORTHWEST TERRITORIES AND THE YUKON

Do you like stories of frontier days? Perhaps you do not know that there is still a frontier today. It is in Canada, in Canada's North—a region larger than the three Prairie Provinces and British Columbia combined. A hundred years ago in all that country there were only a few thousand Eskimos and Indians, living in igloos and skin tents. People thought of the land as cold and barren, harsh and worthless.

Today the frontier is opening and pioneers are going into the land of the Eskimos and Indians. These new pioneers are using aeroplanes and bulldozers instead of canoes and axes. They are building new towns and roads and airfields. Some are helping the Eskimos and Indians to live a safer, happier, and more comfortable life. Others are building

power stations and weather stations, drilling for oil, or opening mines. All are pioneers on this new Canadian frontier.

As you read about northern Canada, look for answers to these questions: Why was the frontier not opened sooner? How important will the northland be to the future of our country?

EXPLORERS OF THE NORTH

Early explorers • During the sixteenth century sailors from Britain and other European countries searched for a short way by sea to China. Some thought they could find it by way of a "Northwest Passage" going north of Canada into the Pacific Ocean. They failed to find the short way to China, but in searching for it they found new lands and



A map of the Northwest Passage showing the routes of some of its explorers.

seas. On the map on pages 6-7, find Hudson Bay, Davis Strait, and Baffin Island. Then try to discover something about the brave adventurers for whom each of these was named.

Other explorers tried to find a way by land across Canada. One of these was Samuel Hearne, who set out from a trading post at Churchill on Hudson Bay. Twice he was forced to turn back, but his third attempt brought him to the Coppermine River which flows into the Arctic Sea. Several years later Alexander Mackenzie travelled northward from his trading post in what is now Alberta. He reached the point where the Mackenzie River flows into the Arctic Sea. The story of our northland is filled with the names of other brave explorers. In your history book find out who some of them were and what they discovered.

The discovery of the Northwest Passage • Although the search for a northwest passage began so long ago, it was not until 1905 that a ship first sailed by this route from the Atlantic to the Pacific. Its captain was Roald Amundsen, a Norwegian explorer. The first voyage in the opposite direction was made in 1942 by a Canadian ship, the RCMP schooner *St. Roch*. Later the *St. Roch*

made the trip from east to west, and a few years ago the ice-breaker HMCS *Labrador* also made this voyage.

Modern explorers • Does much in the Far North still remain to be explored? At the end of World War II the answer would have been "Yes!" At that time some of the far northern islands were not accurately known and there was still the possibility that new land might be found. In fact, Prince Charles Island in Foxe Basin was not placed on the map until 1948. Today all of northern Canada has been mapped. This tremendous project was possible only through the use of aeroplanes. These carried the explorers swiftly from place to place and enabled them to photograph the land surfaces and coastlines so that new maps could be drawn.

Although the discovery of a Northwest Passage was the goal of so many explorers, we now know that this route cannot be used for ordinary ships passing between the Atlantic and the Pacific. Fortunately, in the course of search and discovery, men learned much about this strange and distant land. They found that the North had riches of its own. First they found fur, then, very recently, they discovered wealth in minerals. There is much still to be learned about the North,

for although it is now on the map, there are still parts that we do not know well.

LIFE IN THE GREAT NORTHLAND

Winter and summer • Did you ever think of swimming in the Arctic Sea? People have done so, and then have stretched out on the beach at Tuktoyaktuk, well north of the Arctic Circle, where the temperature sometimes reaches 80 degrees in the shade!

The northland is not all snow and ice, with never a warm day. It is true that the winters are long and that for several months the rivers, lakes, and seas are frozen and snow-covered. Temperatures may fall very low and remain there for weeks at a time. The days are short and the nights are very long—north of the Arctic Circle the sun does not shine even at noon during part of the winter. Strong winds may blow, whirling the dry snow into stinging blizzards.

In July and August, however, the northland is a different world. Days are very long—beyond the Arctic Circle the sun shines the whole twenty-four hours during part of the summer. There are grasses, flowers, shrubs, and in some areas trees that are much like those of the Prairie Provinces farther south. Birds sing, insects fill the air, and fish abound in the lakes and streams. The dog sleds which the Eskimos and Indians use for winter travel are laid aside, and canoes, kayaks, or motor boats are used instead.

Eskimo seal hunter and his son. He is holding a "blind" behind which he will stalk the seal, creeping up on it quietly.



Bulman Photo, courtesy of Hudson's Bay Company

An Indian trapper displays his catch of lynx, fox, and skunk at a trading settlement.

A vast land • What is the North like? What do people do there? These are difficult questions, for our northland is very large and conditions are not everywhere the same.

Perhaps it is easiest first to divide the land into two parts. The dividing line is the tree line. Find it on the map on page 188. In the thousands of square miles north of this line, trees cannot grow because the summer is too

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Summer in the Arctic. Here, two hundred miles north of the Arctic Circle, the ground is bright with flowers.

short. South of the line there are bushlands, which gradually give place to forests farther south. The tree line is also the boundary between the Indians and the Eskimos. The Eskimos like the open spaces; they live in the prairies north of the line. The Indians feel safer among trees; they make their homes south of the line.

The northland has political divisions too. In the west is the Yukon, and east of it lie the Northwest Territories, made up of the districts of Mackenzie, Keewatin, and Franklin. Find these divisions on the map on page 12.

The Yukon and the District of Mackenzie are largely south of the tree line and have almost no northern prairies. Instead there are great forests and rushing rivers.

To the east and north of the tree line lies the true Arctic. Trees are missing, but in summer the meadows are bright with flowers

and plants. Some areas are barren, for the soil is poor and moisture is scarce. Elsewhere there are thousands of lakes. In the east, high mountains and deep fiords offer some of the most exciting scenery in Canada.

New ways of living in the northland • Life is changing rapidly in the North as the frontier opens. Change first came to the Yukon with the Klondike gold rush of 1898. What had been a fur-trapping region became important for mining, and later for lumbering, and hydro-electric power developments.

In the Mackenzie district also, fur trapping was the most important industry, and little communities of trappers sprang up along the Mackenzie River for a thousand miles from Great Slave Lake to the Arctic Sea. Now the fur trade brings less money, and people are turning to the great wealth of minerals in the rocks. Hundreds of prospectors and

scientists work there each summer, and new mines are planned with towns to serve them.

North of the tree line, many of the Eskimos still live by hunting and trapping, but there are no longer enough caribou and other game to feed and clothe them all. They, too, are having to change their way of living. Some carry on a few small industries of their own, such as boat-building, while others work at weather stations, radar stations, in hospitals, or at trading posts. Some are now going to schools in southern Canada to learn new skills. Fortunately their land is rich in minerals, and within our lifetime we can expect to see great changes, not just in the country, but in its people as well.

Aircraft and river boats • In a land where the population is small and roads and railways are difficult to build, river boats and aircraft are very important. Excellent air services link the scattered communities of the northland, and many passengers and much freight are carried by them. But air transport is expensive, and so, for four months every summer, as much freight as possible is transported on the rivers. The greatest waterway is the Mackenzie, which

leads from northern Alberta to the Arctic coast. Along this route large cargoes are carried northward each summer in barges pushed by tugboats.

A Summer Holiday on the Mackenzie

Travelling northward • To see something of one part of the northland, let us visit the Mackenzie Valley. We shall find it much like the northern parts of the Prairie Provinces.

We leave Edmonton by the train that runs northward for almost 300 miles to the town of Waterways. Here the railway ends and river boats take over passengers and freight. Our trip takes us at first along the winding Athabasca River. On the map on pages 124-125 trace the course of this river. Soon after leaving Waterways, we come to the famous Athabasca tar sands — a great deposit of sand mixed with oily tar. A refinery has been built to experiment in producing oil from these tar sands.

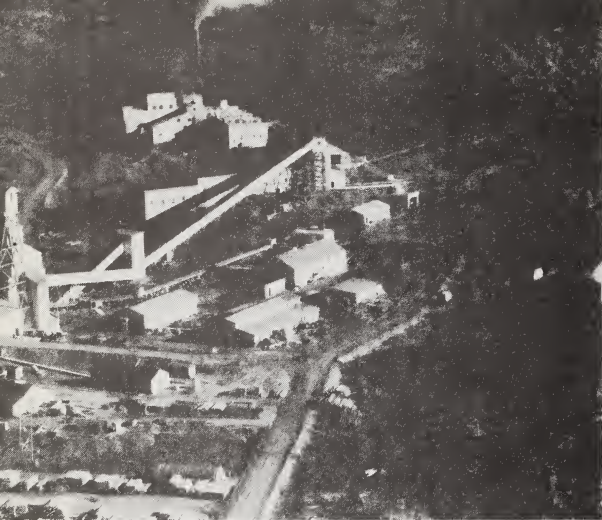
We continue through the shallow waters of Lake Athabasca. Then our boat enters the swift-flowing Slave River, and three days after leaving Waterways we tie up to the

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*Lumber and fuel oil
being unloaded
at Yellowknife.*

*During the
short northern summer
river barges
transport most
of the freight
for the year.*





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A gold mine at Yellowknife.

long wharf at Fitzgerald. As there are rapids and falls which we cannot pass by boat, we must leave the river here to travel sixteen miles by road to Fort Smith. There we are for the first time in the Northwest Territories.

Fort Smith • Fort Smith is still 1200 miles from the sea, but we begin to feel ourselves already in the Far North. We see many Indians in the town, and are told that many of the children in the large modern school are also Indians. Other buildings we see are a hotel, a large Hudson's Bay Company store, several other stores, a hospital, a power plant, and the RCMP building. There are other government buildings too, for this is the headquarters of the whole Mackenzie Valley region. A few miles downstream is a shipyard where boats are built and repaired. There is also a large airfield used each day by many planes flying between Edmonton and the Arctic.

In recent years lumber operations have been started near Fort Smith. Sawn lumber is produced, and at Fitzgerald there is a mill manufacturing plywood. Some of the wood is used at the mines and in the town, and much is exported to the United States.

On the wharf beside the Slave River large

piles of freight are being loaded into barges for the northward journey. There is machinery for mines and oil wells; lumber and equipment for homes, hospitals, garages, and stores; and, of course, great quantities of food for use during the long winter months when the river is closed by ice.

Mines of the northland • After we leave Fort Smith, we visit the gold-mining town of Yellowknife, on the north shore of Great Slave Lake. Yellowknife is a very large town by northern standards. It is spread out beside this northern lake where no one was living in 1935. It looks much like a western Canadian town, with its homes and stores, broad streets, churches, radio station, schools, and a special boarding school for children whose parents do not live within the town. Something rather special is the way the water pipes and sewers are kept from freezing in winter. As they cannot be buried in the rocky ground, they are put in long wooden boxes protected by moss or other insulation. Very important to Yellowknife is the airport, for much of the year the only way of reaching the rest of Canada is by plane.

There would be no town here but for the mines. We see their *headframes*, which rise above the shafts leading to the deep underground workings, and nearby, the tall chimney of the smelter. Gold ore is brought to the surface and crushed and treated to produce the bricks of shining metal which will pay for all the work being done here.

North of Yellowknife, on the shore of Great Bear Lake, is another famous mining town, Port Radium. Not only radium is found there but also uranium, which is needed in producing atomic energy. The ore from this mine makes a long journey to the refinery at Port Hope in Ontario where the metal is produced. On the map on pages 6-7, trace its route by lake, river and rail from Great Bear Lake to the north shore of Lake Ontario.

As time goes on other mines — greater possibly than any in operation now — will open among the lakes and hills of the northland where the ancient rocks are rich in minerals. A very large deposit of lead and zinc has been discovered at Pine Point, on the south shore of Great Slave Lake, and other resources undoubtedly lie waiting to be uncovered.

Oil • The first valuable mineral produced in the Mackenzie area was oil. Our trip down the river brings us to the town of Norman Wells, where the oil wells are located. Oil is a very important product in this area. It provides power for the mines, fuel to heat homes during the long, cold winters, and gasoline to run the boats in summer. Although oil was first produced at Norman Wells nearly forty years ago, it was not until the Second World War that the industry there became important. Today there are many storage tanks on the high bank above the Mackenzie River and tank barges carry the oil to Yellowknife and other mines or down the river to the sea. In the future there may be other oil wells in the northland, for there are signs of the presence of oil all the way from Alberta northward for more than a thousand miles.

Trappers and traders • On our Mackenzie River journey we meet other people besides

miners and oil men. They include trappers and traders. Each riverside settlement has one or more trading posts where the trappers may sell their winter catch of beaver, muskrat, fox, marten, and other valuable skins. Today, because the price of furs is much less than it once was, many Indians in the North must now find other work.

Aklavik • Our river journey northward ends at a large and very modern settlement not far from the mouth of the Mackenzie River. This is Aklavik, a very important town in the northland, with a population of Eskimos, Indians, and people from southern Canada. Some northern villages are old, but this place is brand new. It was built recently to provide new homes for the people from the old town of Aklavik, which had grown up on an island in the river. This proved to be a poor building site: the drainage was so bad that in summer the ground was covered with heavy mud; there was little good drinking water; and there was no firm, dry land for a good airport. After a thorough search, a better site was found, and the people have been comfortably settled there.

A strange new land • Now that we are at the end of our boat journey northward, let us look at the countryside around us. As it is summer, there is no snow and the weather is at times quite hot. The sun shines all day

Oil tanks along the waterfront at Aklavik. Most travel in summer is carried on by planes or by river boats and barges. A hydroplane can be seen moored near the river bank.

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A variety of vegetables is grown in this thriving vegetable garden at Fort Smith.

from a sky usually clear and blue. It also shines at night! At noon it is due south of us, but at midnight it is to the north, in full view but low in the sky. We have reached the Land of the Midnight Sun.

What of the land itself? There are forests beside the Mackenzie River as far north as Aklavik. Many houses in the town have gardens. Of course, the growing season is short, since frosts come late in spring and early in fall, but the plants grow quickly during the long hours of sunlight.

Reindeer herds • Sometimes the people of Aklavik and other Mackenzie Valley settlements have fresh reindeer meat to eat. It is always very welcome. It comes from herds at a reindeer station not far from Aklavik.

During most of the year the reindeer are spread out over the open range, where they feed on the grasses and mosses of the *tundra*, as the arctic prairie north of the forests is called. Most of the herders are Eskimos, but the leader is a Lapp.

The animals in the first Mackenzie River herd were driven all the way from Alaska, a journey that took several years. To care for the animals on this journey, and to train the Eskimos in reindeer herding, the government brought in Lapp herders from Norway.

Early each winter there is a roundup, when the reindeer from the various herds are

sorted out and used to provide fresh meat for the local people. The "cowboys" of this roundup are Eskimos, who dress in warm caribou clothing and travel swiftly on skis.

Northern farms • When we set out for the northland, we did not expect to find gardens and even small farms a thousand miles north of Edmonton. Yet at Fort Simpson there is a fine modern *experimental farm*. It is managed by the government in order to discover what plants will grow best in the short northern summer. Even wheat has ripened there, and many kinds of vegetables and flowers grow well.

Although most northern soils are poor, those near the rivers and lakes are usually good. There are smaller gardens at all the villages along the Mackenzie and other northern rivers, and larger ones at towns like Yellowknife and Fort Smith. Remember that the sun shines for many hours during the long summer days and warms the soil and the air above it. The Mackenzie Valley is often one of the coldest parts of Canada in winter, but its summers are as warm as parts of southern Quebec and Newfoundland.

Northern schools • Children in northern Canada, like those farther south, need to go to school, yet it is not always easy for them to do so. Many of them, especially Indian and Eskimo children, have no settled home. These children attend school for only a part of the year, sometimes during the summer. Children who live in villages the year round attend school for the usual months and have the long summer days for holidays.

Some northern children are unable to reach a school even in summer. To help them, the teacher must travel to the distant hunting grounds. She must learn to live in a tent or snowhouse, travel by canoe, motor boat, or dog sled, and sometimes teach her pupils in the open. At the end of her visit she leaves with the children exercise books and work to go on with until she comes again.



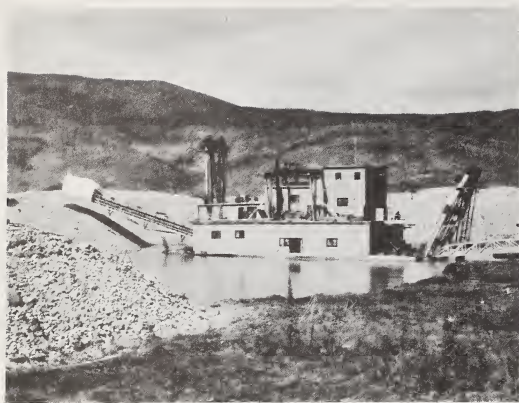
Some Eskimos attend schools in southern Canada, where they learn to be tractor drivers, mechanics, carpenters, and radio operators. There are good jobs in the North for such men, to help them make a living where trapping is poor. The new town of Aklavik was built partly by such Eskimos.

Journey from Aklavik • We shall return south from Aklavik by plane, as the trip upstream by river boat would take a long time. We take off from a good airport and head back up the Mackenzie Valley.

Seated next to us is a mining engineer from the Yukon. Some time after the take-off, he points to the west where we can see the high ranges of the Mackenzie Mountains in the distance.

"Over those mountains is Dawson, where I was born," he says. We ask him to tell us about the Yukon.

"You'd never believe how times have changed since I was a boy in Dawson. In those days Dawson was the capital of the Yukon and a gold-mining centre. It was a



A gold dredge at work in a Yukon river. It washes and sifts the sands and gravels to obtain the gold.

difficult place to reach. Miners travelled by train to Vancouver, then took a steamer up the Inside Passage to Skagway — that's in Alaska, you know. There they boarded a train for Whitehorse, 110 miles away. It was a small train on a *narrow gauge line* (where the tracks are closer together than usual), and what a time it had pulling its passengers through the mountains! The line is still there, but it is much more modern now. From Whitehorse some people went by river boat, others by canoe or barge, down the Yukon River to Dawson. Yes, it was some journey in those days, though easy as compared with the months it took the 'old timers' of the gold rush to get there.

"And today," he went on, "I can take this plane at Aklavik, change at Fort Simpson to another that will take me across the Alaska Highway and on to Whitehorse, all in one day! I live in Whitehorse, now the capital of the Yukon and a busy and growing little city."

We ask about the Alaska Highway.

"That was built during World War II," our friend tells us, "to give the United States an overland route to its territory of Alaska. Since then the road has been greatly improved. It is used regularly now by buses,

trucks, and cars. Pipe lines run along some parts of it too, to carry oil to northern towns."

When we ask him if the Yukon is still a great place for gold mining, he insists that it is more important than ever before.

"Of course, ways of mining have changed a lot," he says. "In the old days it was done with pick and shovel and pan. Now huge dredges driven by electricity do the work. The dredges suck up the river sand and gravel and pass it through sluices to separate the heavy gold from the waste which is then dumped back into the stream. To get more gravel to use, the river banks are washed down with a powerful hose. This is called 'hydraulicking,' and what a sight it is to see the huge stream of water, like that from a fire hose, playing in the sunshine! But machinery to do work like that costs money. The price of a dredge is often over a million dollars and only big mining companies can afford to own and operate one. Ordinary lode mining is also carried on in the Yukon, and as well as gold, we are also great producers of lead, zinc, and silver. A fine main road now links Whitehorse with the lead and zinc mines of Keno Hill.

"There is much to learn about the Yukon," he goes on. "It is nearly as large as the Province of Manitoba.

"Don't think of us as living in a land that is frozen all the time. Parts of the Yukon have as good gardens as the Mackenzie Valley, and perhaps better, and we have some good farms too. More roads are being built, so that we do not depend on the Yukon River as much as we used to, and of course we have excellent air services too. Our rivers are still useful though, for they provide electric power for our mines and homes."

The Eastern Arctic

Are there no ice-filled seas and frozen lands in the Far North? There are, but to see them we must visit the eastern Arctic, a land

very different from the Mackenzie Valley and the Yukon. First we go to Churchill on Hudson Bay. Find this Manitoba seaport on the map on pages 6-7. As you discovered on page 123, the shortest route for wheat from the prairies to Europe is by way of Churchill, Hudson Bay, and the Atlantic Ocean. Since this route can be used only during the warmest months, the port is extremely busy from late July until late October.

Churchill is also an important air centre, for it is the main airport used by planes which carry men and supplies to many northern weather and radar stations and other places in the distant arctic islands.

Spring airlift • Far to the north of Hudson Bay, scattered over the Queen Elizabeth Islands, there are weather stations. Some are so far north that they have never been reached by ships. Supplies and men can reach them only by plane, using the frozen sea as a runway. Why are these stations so far from the rest of Canada? They are there to send out weather reports by radio, because the weather in the Arctic has a great affect on our weather farther south. Let us visit one of the stations and learn about life there.

On Prince Patrick Island, about 1300 miles northwest of Ottawa, there is a small village. It is named Mould Bay after an explorer who first reached the place by sledge across the frozen sea about a century ago. No ship has ever been able to break through the thick arctic ice to enter the bay. Everything was carried in by plane. Find Mould Bay on the map on pages 6-7.

The best time of year for arctic flying is in spring. At that time the weather is good, there is enough daylight, and the ice and snow are still firm enough to allow planes to land. It is in the spring, therefore, that the "air-lifts" to the Far North take place.

We take off from Churchill airport early one April morning in a freight plane well loaded with building materials, cases of food,

scientific instruments, sleeping bags, and many other things. Between the piles of freight are the passengers — weather men, scientists, flyers, an RCMP constable, two Eskimos who have been trained as mechanics, and an engineer going to the Distant Early Warning Line, usually called the DEW Line, which is a system of radar defences stretching across our northland. With only one stop on the way, we land at Resolute, five hours away and far to the north of the Arctic Circle.

On arrival there, we find the weather very cold, with a strong wind blowing in off the sea ice. The sun is shining brightly, and there is a dazzling glare from the snow on the runway. Nearby is the RCAF station. There is a weather station too, and other buildings where scientists are at work, as well as repair shops for aircraft and large gasoline storage tanks. Nearby is a village of Eskimos, all of whom moved north in a government ship a few years ago. This is much farther north than Eskimos were then living; these Eskimos came because the hunting is so good.

Soon we are off again on the last 500 miles of the flight to Mould Bay. Our pilots have to find a tiny speck on the thousands of square miles of white snow below us. Yet in

New sights in the Arctic: a jeep and radar domes of the DEW Line on Baffin Island.

National Defence Photo





National Film Board Photograph

Supplies are landed by barge from the ship C. D. Howe at Pangnirtung on Baffin Island.

a few hours we are circling the little group of orange-coloured buildings and soon have rolled to a stop on the snow-covered ice-runway. As the plane door opens, we are met by bearded men in arctic clothing, for here it is as cold in spring as the Canadian prairies in winter. Everyone works at emptying the plane so that it can take off before the engines become too cold to start. As soon as possible we are off again, this time for the south. The weather men will remain at the station for another year, sending out the radio reports that make life easier and safer for us two or three thousand miles away.

ARCTIC FLYING PROBLEMS • Flying in the Arctic is no more dangerous than elsewhere, but it does have special problems. Some of these are listed below. Learn what you can about them from this chapter or in an encyclopedia.

1. Stars cannot be used for navigating the plane in summer. Why?

2. The magnetic compass cannot be trusted to point correctly in the North. To what place does the compass point?

3. Map reading is difficult in the Arctic. In winter it is not easy to tell land from water, and the absence of trees, roads, railways, towns, and other landmarks adds to the problem of navigating.

4. The very cold weather makes repair of planes difficult.

5. The engines become very cold when the planes stand idle.

6. All supplies, spare parts, and machinery must be brought from farther south.

Arctic ship • It is August now. At the Churchill wharf we see a ship that looks unlike either a passenger ship or a freighter. This is the famous Arctic Patrol ship, the *C. D. Howe*, which leaves Montreal each July and remains in the Far North until early October. On the first part of its journey, this sturdy vessel calls at ports along Hudson Strait and Hudson Bay. It brings food and other supplies, carries the mail, and has on board inspectors from the government, who check on conditions in the north-

land and discuss with the residents plans for the future of the region. On the ship too are doctors and nurses who examine people in the settlements visited. Passengers also include RCMP officers going to and from their northern posts, as well as traders, missionaries, teachers, and northern service officers who live with the Eskimos and help to guide them in their changing life. At Churchill, new supplies and passengers are taken on board and the *C. D. Howe* again sets out on the most dangerous part of the voyage through the ice-packed seas of the Far North.

Eastern Arctic settlements • Settlements like Pangnirtung and Arctic Bay in Canada's eastern Arctic are quite unlike those we saw in the Mackenzie Valley. The climate here is too severe for trees to grow. The ground is covered with tundra vegetation — grass, moss, and dwarf bushes — with large areas of bare rock. Vegetables are difficult to produce, for the growing season may be little more than a month. The summer is short and cool, while the winters are long and cold. The sea is blocked by ice for three-quarters of the year and land travel is made difficult by the short winter days. In spite of all this, life goes on in the settlements. Not all of these are alike, but there is usually a trading post, a church, a school, a radio station, an RCMP station and sometimes a hospital.

*New ways of making
a living in the
Northland. This
Eskimo is driving
a tractor.*

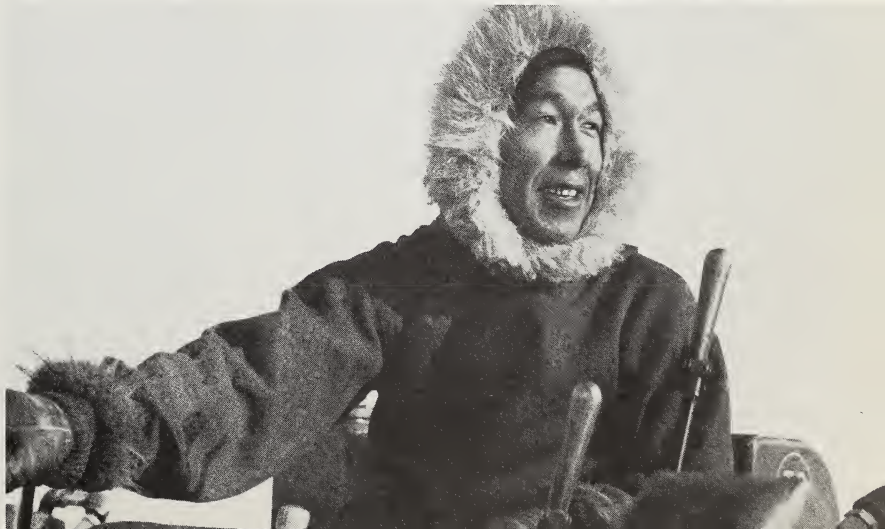


National Defence Photo

Frobisher Bay, a new Eskimo village on Baffin Island. Banking snow around houses to keep out wind and cold.

Eskimos of the eastern Arctic • Many of the white people who live in these northern villages are there to help the Eskimos in one way or another. As we know, Eskimos are the native Canadians who live north of the tree line. Most of them are still hunters, who live by catching seals, white whales, and walrus, by fishing, or by trapping foxes. They visit the trading centres only a few times each year to get necessary supplies and to sell their furs. Farther inland, in Keewatin, the Eskimos depend upon the caribou for food and clothing. Since caribou are growing scarce,

National Film Board Photograph



life for these Eskimos is becoming very difficult.

As the North is opening up, more and more Eskimos are turning to new ways of making a living. Especially near large air fields, the Eskimos have learned to become skilled workers. Their way of life is changing as new developments come to their northern land.

Crossroads of the air • Look again at the map on page 181. Lay your ruler across it so that it touches the first *A* of *America* and the last *E* of *Europe*. Does the line cross northern Canada and Greenland? This line shows the most direct way from western North America to Europe. Every day jets take off from Edmonton and other western cities to follow this route over Hudson Bay. Sometimes they stop for refueling at bases north of the Arctic Circle. Other routes from Europe go to Asia by flying across Canada and Alaska. The early explorers sought the Northwest Passage as a quick route by sea to the Far East. These northern air routes are the modern "Northwest Passage." Do you agree that the Arctic is a "crossroads of the air"?

ACTIVITIES • 1. With a globe and a flashlight in a darkened classroom, try to find the explanation for the midnight sun. Be sure that the north pole of the globe points to the north of the classroom. Hold the flashlight so that its light shines straight down on the tropic of Cancer. That is how the sun's rays actually shine there at noon on June 21st. Over Aklavik, on the globe, paste a tiny piece of red paper or make a dot with red chalk. Now rotate the globe from west to east (this is the way the earth turns on its axis) and watch the red dot. Is it always in the light? When the dot is nearest the flashlight it is noon at Aklavik. The sun's rays are then more nearly vertical, and the sun is at its highest in the sky. When the dot is farthest from the flashlight, it is midnight at Aklavik. The sun's rays are then very slanting, and the sun is very low in the sky, almost on the horizon.

On the globe put a yellow dot where you live. Holding the flashlight and rotating the globe as

before, watch the yellow dot. Is it always in the light? Compare the length of your summer nights with those at Aklavik. At which place is the sun higher in the sky at noon?

Repeat the whole experiment to show winter conditions. The north pole of the globe still points to the north, but the flashlight is now held above the tropic of Capricorn.

You will want to write in your notebook all that you have learned.

2. Re-read this chapter. How do the places described differ from your home town in the matter of weather, in the way the people live, and in the way they work and travel? If you could visit only one of these places, which would you choose, and why?

3. On a large map of the Northwest Territories, the Yukon, British Columbia, and Alberta, show the rivers, lakes, and towns mentioned in this chapter. Show the chief mountain ranges by shading; print in their names. Show the position of the tundra. With crayons of different colours show: (a) the route which the radium ore follows from Port Radium to Ontario; (b) the air route to Whitehorse from Edmonton; (c) the land and water route from Vancouver to Dawson by way of the Inside Passage; (d) the air route from Churchill to Mould Bay. Be sure to add a key to your map to explain what each colour means.

4. Ask your teacher to help you to find information about radium. Why is it so precious? What is it used for? Perhaps you can find something about Madame Curie, who gave her life to discovering and experimenting with radium.

BOOKS TO READ • For more information about our Arctic, you might enjoy reading:

The Story of Our Canadian Northland, by JOSEPH M. SCOTT (Dent).

FOR THE TEACHER

Peoples of the Northwest Territories, Industries of the Northwest Territories, Transportation and Communications in the Northwest Territories, three pamphlets from the Department of Northern Affairs and National Resources, Ottawa.

Canada and Russia, by R. A. J. PHILLIPS, from The Canadian Institute of International Affairs.

A REVIEW OF CANADA

Now that we have studied all the provinces and territories one by one, let us go back and take a look at Canada as a whole.

HOW LARGE IS CANADA? 1. In Unit I you took a trip across Canada. By using a railroad timetable, find out how many miles it is from:

- Halifax to Montreal;
- Montreal to Winnipeg;
- Winnipeg to Calgary;
- Calgary to Vancouver.

Add these distances and find out how far it is from coast to coast by rail.

Using the map on pages 6-7, find the distance from Windsor, Ontario, to the northernmost point of Ellesmere Island.

2. Look on page 240 to find the area of Canada. It is given in square miles. (A square mile, you know, is a square each side of which is a mile in length.) Canada is a very large country. Is it larger or smaller than the United States? Find the area of the United States on page 241.

3. In what ways is a large country a help to the people living in it? In what ways may it be a hindrance? Discuss these questions in class.

HOW MANY PEOPLE LIVE IN CANADA? 1. A large country needs a large population, or many people, to live in it. On page 240 find out what the population of Canada was in 1961.

2. Which has the larger population, Canada or the United States?

3. If we divide the number of people in a country by the area in square miles, we find out about how many people live on each square mile of land. Which has the greater number of people on a square mile, Canada or the United States?

WHERE DO THE PEOPLE LIVE? 1. Neither Canada nor the United States has the same number of people living on each square mile of land. Look at the map on page 16, which shows where the people of our country live. Write a sentence or two to tell in what parts of our country most of the people live. Give as many reasons as you can why this is so.

2. Which province of Canada has the most

people? Which province ranks next? About what part of the whole population of Canada is found in these two provinces?

CANADA'S NATURAL REGIONS • 1. Through how many provinces and territories does the Laurentian Upland extend? Describe its surface briefly.

2. Canada has three important sources of wealth in the Laurentian Upland. One of these can never be replaced after it is used; the other two may be destroyed if used carelessly. What are they? If you are not sure, find "Laurentian Upland" in the index and read the pages listed.

3. Give as many reasons as you can why farming is not important in the Laurentian Upland. There are two farming districts in this region, however. One is in Quebec and the other is in Ontario. Where are they? What crops do they produce? Why is farming possible there?

4. Name and locate the chief plains of Canada. Which of these plains is high? Which are low? Which is the most densely populated? Which plain has scarcely any people living on it?

THE CLIMATE OF CANADA • We have already learned that the climate, or the weather that a place has throughout the year, is not the same all over the country. We know that in the far northern parts of the country the winters are so cold and the summers are so short that very little grows, even though the long summer days may be quite hot. We know, too, that even in the southern parts of the country the winters are cold, though the summers are long enough and warm enough to allow many crops time to ripen.

1. Which parts of Canada have the mildest winters? Give the reason in each case.

Temperature is not all that we need to consider when we think of climate, however. Rainfall is very important, too. In speaking of rainfall we include snow; in fact, all the moisture which falls on the surface of the earth. Our rainfall is measured in inches. When we say that an inch of rain has fallen, we mean that enough water has fallen to cover the ground on which it fell to the depth of one inch. Ten inches of snow are equal to about one inch of rain.

2. Look at the map on page 15. Find those



The oat lands of Canada.

parts of our country which have the most rain. How can you explain the heavy rainfall in these parts? Find those parts of our country which have the least rainfall.

In the southern part of Canada at least 15 inches of rain are needed for the growth of most crops. Where there is less than 15 inches of rain, trees will not grow, and only a few crops will grow unless water is brought to them by means of irrigation. One of these crops is wheat.

Find those parts of our country which have less than 20 inches of rain yearly. Then turn to the map on page 135 which shows where wheat is grown. About how much rain falls yearly on the wheat lands?

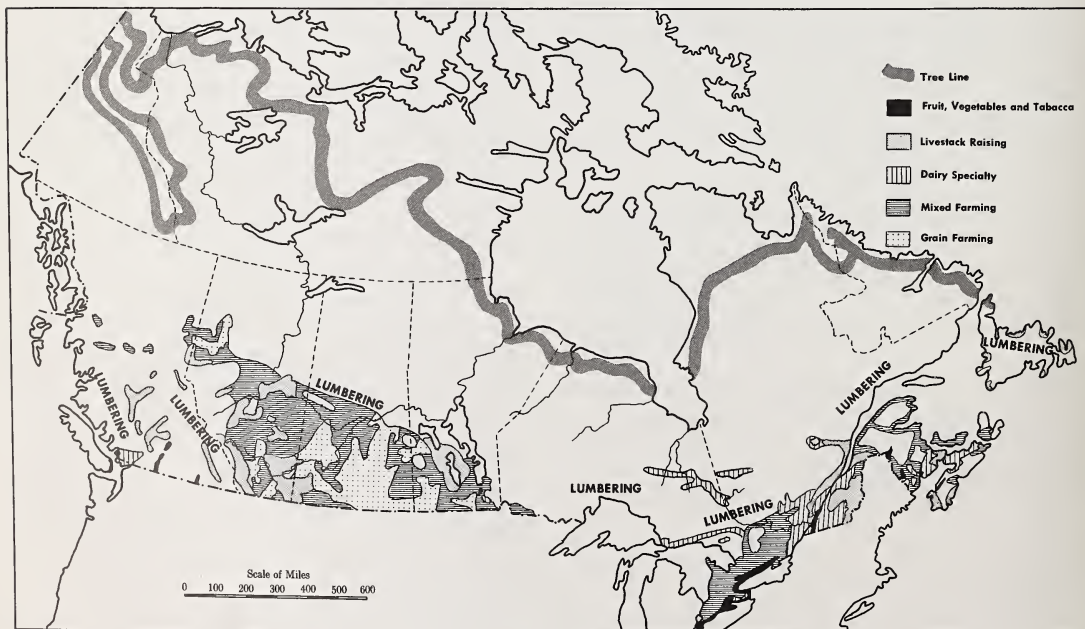
3. Now look at the map on this page which shows where oats are grown. Although you find oats growing in the same part of the country as wheat, on the whole does wheat need more or less rain than oats? Does it need more or less heat than oats? Now explain why oats rather than wheat are grown in the Atlantic Provinces.

AGRICULTURE IN CANADA • 1. Look at the map on this page showing the agricultural regions of Canada. Do mixed-farming regions need more or less rain yearly than wheat regions? What crops are produced in a mixed-farming region?

2. Looking again at the map of the agricultural regions and at the rainfall map, find what use is made of those lands in southern Canada which are too dry even for the growth of wheat. In which provinces do you find them?

3. On the map find also the fruit-raising

Agriculture and lumber in Canada.



districts of Canada. In which provinces are they? What fruits grow in Ontario that do not grow in the other provinces? Why is this possible?

4. Which province has the greatest amount of agricultural land?

MINING IN CANADA • 1. Re-read those parts of each unit in this book which describe mining, and on a large outline map print in blue or black the names of the mining towns, and in red the name of the mineral mined near each. The map on page 141 will help you.

2. Refer to the *Canada Year Book*, or to some other reliable source, to find the five most important minerals in Canada. List these in order of importance and show what is done with each.

3. Compare the mineral map with the map of the physical regions of Canada on page 13. Which region has the largest number of minerals? What minerals are found in the western mountains? What are the only minerals in the plains?

FISHING IN CANADA • On a large outline map of Canada colour in blue the chief fishing grounds and print in the names of the fish caught. On your map show which fish are exported, and the countries to which they go.

CANADA'S TOURIST TRADE • 1. Draw a large map of Canada and on it show the chief tourist attractions. Railway folders will help you.

2. Some of you may prefer to make posters which advertise some one Canadian playground.

LUMBERING IN CANADA • Study and report on Canada's lumbering industry. This will include pulp and paper, paper products, sawmill lumber, shingles, cellophane, plastics, and furniture. You might divide the class into groups, each of which would report on one of these topics.

MANUFACTURING IN CANADA • In the same way report on some of the chief manufacturing industries. These include: iron and steel industries, flour milling, shipbuilding, and the manufacture of automobiles and textiles. Name and locate the places where the largest manufacturing plants are found. For each industry report on the

raw products used, the route by which they are brought in, the source of power used, and what is done with the finished article.

CONSERVATION IN CANADA • Make a report on conservation in Canada. You will find information in this book, in reference books in the school library, and in nature magazines. Include conservation of forests, soil, water, grasslands, farm lands, fish, wild animals, and birds.

TRANSPORTATION IN CANADA • 1. Canada's railways are among the best in the world. They reach from coast to coast and have many branch lines. Study the transportation map on page 116 to discover those parts of Canada into which railways have not yet been built. From what you have learned about mining, farming, or lumbering in these regions, suggest where new railway lines are needed.

2. Canadians did much pioneer work in transport by air. Bush pilots carried prospectors, miners, trappers, and doctors, as well as mail and freight of many kinds, into the northern country, where there are neither roads nor railways. Study the map showing railways and air routes and compare the two (page 116). What parts of the country which railways do not reach are served by air routes?

And so we have come to the end of the study of our country for this year. As you grow older you will learn more about Canada and how it is developing as the years go by. We have seen that Canada is a large, rich, and beautiful country. But in spite of its wealth and its beauty, it can grow into a strong and a great nation only as its people become strong, industrious, unselfish, and determined to help one another. Each of us, old or young, must play his part in developing our country. Each must be ready to do his duty so that Canada may always be the home of a free and peaceful people.

Later we shall learn of other people living overseas and shall find out how they produce goods that we need to use. We shall then understand how we as Canadians can do our share to make the whole world happy and prosperous.

VIII • Our Neighbour to the South



© American Commercial Photo Co., from Ewing Galloway, N. Y.

The Ambassador Bridge, between Windsor (right) and Detroit, links Canada with the United States.

THE UNITED STATES

THE COUNTRY AS A WHOLE

Our friendly southern neighbour • Most of the people of Canada live in the southern part of our country, fairly close to the boundary that separates us from the United States. For this reason, Canadians generally know a great deal about their southern neighbours. The people living on both sides of the line do about the same kinds of work. Many Canadians have friends or relatives in the United States. Many of the books and magazines we read come from there, and radio and television programs cross the border without difficulty. Most of the movies we see are made in the United States, and many of the foods we eat and the articles we use are imported from that country. For these and many other reasons, we who live in Canada are greatly interested in our friendly neighbours to the south.

We are accustomed to thinking of the United States as a very large and powerful nation when compared with Canada. It is true that the population is about ten times the size of ours, but Canada is actually larger in area. While reading this chapter, try to list some of the reasons why there is this very large difference in the population of the two countries.

Discovery and settlement • While Champlain was exploring and trying to found a settlement in Nova Scotia, he also sailed southward as far as Cape Cod, near the present city of Boston. He made no attempt, however, to found a colony there. Farther to the south, Spaniards had already crossed from the West Indies to the coast, and in 1565 had founded, at Saint Augustine in what is now Florida, the first permanent settlement in North America.

The first English settlement was made in

1607 on the James River in Virginia. Was this before the founding of Quebec? In an encyclopedia or a history book, read the story of the Indian Princess Pocahontas and Captain John Smith, one of the earliest English settlers.

Some years later, in 1620, the Pilgrims crossed the Atlantic in the little *Mayflower* and settled at Plymouth, Massachusetts, beginning the first of the New England colonies. In 1634 a group of Roman Catholics, under Lord Baltimore, settled on the shores of Chesapeake Bay, while in 1682 William Penn came from England with some members of a religious group known as Quakers to settle in Pennsylvania.

The English and Spaniards were not the only settlers along the east coast. Pioneers from other countries founded colonies as well — the Dutch along the Hudson River, Swedes along the Delaware, and Germans in Pennsylvania.

Peoples of many nations • In the more than three centuries that have passed since these early settlements, people have reached the United States from every part of the globe. They were of many races, spoke different languages, and were accustomed to living and working in many different ways. In time there grew up from these many peoples a new and united nation.

As the population increased and still more people wished to move to the new country from the old lands of Europe and Asia, a limit was set on the number who might be admitted. These *immigration laws*, as they are called, now allow only a certain number of people to enter the country as settlers each year. However, the United States is still looked on as a land of opportunity for the poor, the ill treated, and the displaced persons of other lands.

Comparison with Canada • As our two countries share most of the large continent of North America, we shall expect them to be alike in

many ways. Look at the map of landforms on page 192. You can see from it that many of the regions of Canada extend into the United States. This, of course, means that near the border the surface of the two countries is similar, and this helps to explain why the life and occupations of people on both sides of the line are much alike.

The two countries are similar in other ways. The rainfall map on page 15 shows three important likenesses: (1) the eastern half of both countries has enough rain for crops, without the need for irrigation; (2) the west coast northward from California is even wetter and is the wettest part of both countries; (3) between these two moist regions is a large area in the west which is much drier.

The great difference in climate between Canada and the United States is in temperature. If we were to examine a temperature map, we would see that on the average the United States is warmer than Canada. This is mainly because it lies nearer the equator.





The map on pages 208-209 shows how the mainland United States is divided into forty-eight states. (Alaska, the forty-ninth state, lies north-west of British Columbia; the fiftieth state, Hawaii, is a group of islands in the southern Pacific Ocean.) The mainland states are in many ways like the ten provinces of Canada.

The world's greatest industrial country • Although there are other countries with greater populations than the United States, it is the greatest industrial nation in the world, and its people have a higher standard of living than any others. There are many reasons for this — the rich natural resources that for long lay untouched; the varieties of soils, climates, forests, and grasslands; the skill and hard work of its people who came from many different lands; and the absence of wars within its boundaries, which would use up resources, cause destruction, and cost the



LAND FORMS OF NORTH AMERICA

Scale of miles
0 100 200 300 400 500

- | | |
|---|---|
|  Lowlands |  Plateaus |
|  Great Plains |  Mountains |

lives of many of its best people. As you read on, watch for other reasons that explain the industrial leadership of the United States.

MAP STUDY • 1. On the map on page 192, compare the east and west coasts of the United States. Which has more bays and other inlets? Which has more rivers draining into the sea? Which of the two has the wider area of lowland close to the sea? Do you agree that in each case the answer is the east coast?

The west coast has high mountain ranges close to the water's edge. There are very few inlets, and the continental shelf is also very narrow. On the east coast there is a broad coastal plain across which many rivers run down to bays, estuaries, and other inlets. Off the east coast there is a broad continental shelf covered by shallow water.

2. Trace the Appalachian Highland from Canada southward. In what state does it end?

3. Most of the Laurentian Upland is in Canada, but there is an important part in the United States south of Lake Superior. Another part is the Adirondack Mountains, which are linked to the Laurentian Upland in Canada by a low stretch of very ancient rocks which cross the St. Lawrence at the Thousand Islands. On the map on page 192, locate each of these areas.

4. Find the Central Plains and the Great Plains. These correspond to the Canadian prairies.

5. Locate the Interior Highlands. These are something we do not have in Canada — an upland region rising sharply out of the plains. They once formed an island when long ago the plains were still under the sea.

6. The mighty Mississippi River runs through the heart of the Central Plains from near the Canadian border in Minnesota to the Gulf of Mexico. Follow its long, winding course on the map. Note also its main tributaries, the Missouri flowing in from the west and the Ohio from the east.

7. The map also shows that the United States, like Canada, has high and rugged mountain ranges in the west. These western mountains are not so old as those in the east, but they are

much higher. Note especially the Sierra Nevada, Cascade Range, and Coast Range, and the Rocky Mountains farther east. Between the Rockies and the far western ranges there is a high plateau region, just as there is in Canada. It has different names in different regions. Notice the Great Basin, the Colorado Plateau, and the Columbia Plateau. Find again the Interior Plateau of British Columbia.

There are no very large lowland areas in the far west, but there are two important smaller lowlands that you should remember. They are the Central Valley of California and the Puget Sound Lowland.

THE NEW ENGLAND STATES

We shall begin the study of the regions of the United States in the northeast. Six states here are usually grouped together and called New England. When was this name first given to them and why? These states are Maine, New Hampshire, Vermont, Massachusetts, Connecticut, and Rhode Island. Locate each of them on the map on pages 208-209. Which is the largest? Which is the smallest? Which has no seacoast? Which states border on Canada? Find the border separating Quebec and Vermont. It runs in a straight line, and happens to lie exactly half way between the north pole and the equator. Notice how the mountains of Canada extend southward into New England. What name is given to them?

Comparison with eastern Canada • The mountains of New England are generally higher than those of southern Quebec and New Brunswick, and the valleys between them are usually narrower. The climate of the two regions is much the same, with cold snowy winters and warm summers. As you travel southward, the summers become longer and warmer and the winters not quite so cold. Everywhere there is plenty of moisture.

The country people of the two regions do much the same kinds of work, but in New England there are far more people engaged



Three Lions. Photo by John Dominis

Fish being unloaded at Gloucester. They travel on a moving belt to the processing plant.

in manufacturing than there are in the nearby parts of Canada.

Farming • The first New England settlers farmed the lower lands near the Atlantic coast. In time they moved inland to settle the hilly uplands and the river valleys. When better lands were found in the West, many

of them moved on and left the old homes deserted.

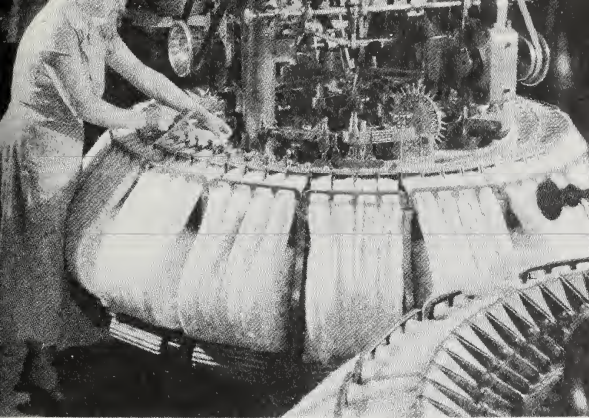
Today, only the best lands in New England are farmed. Most of the crops are used to provide food for the large and small cities nearby. The best paying crops are vegetables and fruits. Maine is noted for its potatoes. Cape Cod, in Massachusetts, is famous for its cranberries. Vermont and New Hampshire produce maple syrup and sugar, while there are many apple orchards on the lower slopes of some of the hilly country. The lower Connecticut Valley is famous for tobacco. Most important of all are the dairy farms, which sell fresh milk to the near or distant cities, or make it into butter or cheese. Most dairy farms are on the more fertile land of the valley bottoms.

Fishing • As in our Atlantic Provinces, fishing has been important in New England from the time of the first settlers. The thin soil of the hillsides could not alone give a good living. In boats made from the local timber, the early New Englanders had to turn to the sea for food. Today, modern fishing fleets from New England still go out to catch the cod, halibut, haddock, and other fish of the nearby banks. Boston is the most important market for fresh fish in the United States, and Gloucester is another famous

A small dairy farm near Boston. New England has many dairy farms, both small and large, which help to supply its busy cities with milk, cream, and butter.

James Sawdors





W. M. Rittase

An operator using a machine for combing wool in a woollen mill.

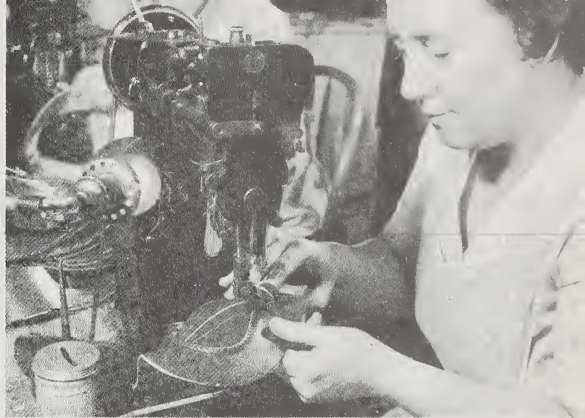
fishing port. Lobsters provide an important industry for some coastal villages.

Forests and lumbering • Before the first Europeans arrived, the hills of New England were covered with forests of hard and soft woods. Great stands of white pine covered the drier ground, while beech, birch, maple, and hemlock were found in the hollows. Bangor, in Maine, was once famous as a lumber town, and logs from nearby forests were carried to all parts of the world in locally built ships.

Those days are past, for no care was taken of the forests. The best trees were long ago felled and have been replaced by smaller growth. Now there is still work in the forests in winter, but it is mainly the cutting of logs for the pulp and paper mills. Small amounts of lumber are still used locally.

Mining • New England has many small deposits of minerals, but few of them can be worked at a profit. However, the rocky hills provide valuable building stone. Slate, marble, and granite are quarried in Vermont, Maine, and New Hampshire.

Manufacturing • It is in manufacturing that New England has long been a leader in the United States. The early New England farmers were unable to buy the articles they



By Ewing Galloway, N.Y.

A shoe-factory operator using a machine to stitch parts of a "loafer" together.

needed and so had to make them for themselves. In this way many of them became skilled craftsmen. Where the streams provided water power, mills for grinding grain or sawing logs were built. Water power together with skilled workers led to the beginning of weaving, spinning, and other textile industries.

At first raw materials were brought to New England ports in ships. Later on they

Looking down into the pit of a Vermont marble quarry. This state is famous for its marble.

By Ewing Galloway, N.Y.





Fairchild Aerial Surveys, Inc.

The port of Boston from the air. The two tall smoke stacks in the foreground belong to a coal-burning steam plant which generates electricity.

were also brought by railways. In time, factories were built and large industries began to grow. New England became the first great manufacturing region in the United States. Industry has since spread to other parts of the country, but the local industries are still kept busily at work.

The textile industry is still very important and New England leads all parts of the United States in wool manufacturing. It once was the centre of cotton manufacturing as well, but this is no longer so. Many of the largest and most modern cotton mills are now in the southern states. Other leading industries of New England are the manufacture of boots and shoes, the production of many kinds of metal goods, the making of valuable machine tools, the manufacture of electrical goods, and, along the seacoast, shipbuilding. New England is still famous for the skill of its people.

Tourist and resort business • People who live in very large cities, especially in those which

are hot in summer, like to spend their vacations in New England where the weather is cooler. There are many lakes and wild, forested hillsides to provide attractive scenery. There are also many beautiful inlets and islands along the coast, particularly in Maine. In winter there is good skiing, and in other seasons fishing and hunting draw tourists to the region. Entertaining and caring for these tourists has become an important and growing industry in New England.

Boston • There are many cities of more than 100,000 people in southern New England. Some are seaports, founded long ago, and all are now important manufacturing centres. By far the largest is Boston.

Boston is often called "The Hub" because most of New England's transportation routes lead into it like the spokes of a wheel. It is connected by roads and railways to New York on the south and Montreal on the north, and other lines run through New York

State to the West. Ships and international airlines link it with Europe across the Atlantic on the east.

The city is built around a splendid natural harbour on a stretch of lowland and hills. It was founded about three centuries ago and has many historic buildings. Some of its narrow streets and quiet squares remind one of Quebec.

Many of the raw materials used in New England's industrial cities are imported from overseas through Boston. The city also has a large variety of industries of its own, especially the manufacture of clothing, textiles, and shoes. In recent years it has become a centre of light industries, such as radio manufacture and the making of electrical equipment. Heavy metal goods cannot be made profitably as there is no local steel industry in New England.

Boston, like Montreal and Toronto, is an important financial centre with many banks

and insurance companies. It is also world famous as a centre of education, with several universities and colleges nearby.

SOME QUESTIONS TO ANSWER • 1. Farming is not easy in New England. What are some of the difficulties?

2. Why did fishing become important in New England?

3. Why is there no large steel industry in New England?

THINGS TO DO • 1. Read again pages 193-197 and write down as many ways as you can in which New England is like the Atlantic Provinces and southern Quebec. How does the population of the six New England States compare with that of our five easternmost provinces? How do you explain the difference?

2. New England has had many poets and authors who have written about life there — Longfellow, Emerson, Whittier, Thoreau, Hawthorne, Louisa M. Alcott, Robert Frost. Try to find and read some of Longfellow's poems or Alcott's *Little Women*.

Where the people of the mainland United States live.



THE MIDDLE ATLANTIC STATES

The Middle Atlantic States are seven in number — New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and West Virginia. They were among the first parts of the United States to be settled, and their population today is around forty million, about a quarter of the country's total. The map on page 197 shows that these seven states include some of the most densely populated areas of the country. On the map on pages 208-209, locate each of the seven states. Which of them has no seacoast? Which two reach to the Great Lakes? Do any of the seven reach the Canadian border?

Although most of the Middle Atlantic States seem to be densely populated on the map, there are very great differences from place to place. There are also differences in the way the people live. If you could fly over the region low enough to see what was going on below, you would see great crowds of people hurrying about in cities such as New York, Philadelphia, or Baltimore; lonely forest rangers high in the Appalachians; vacationists enjoying themselves along the

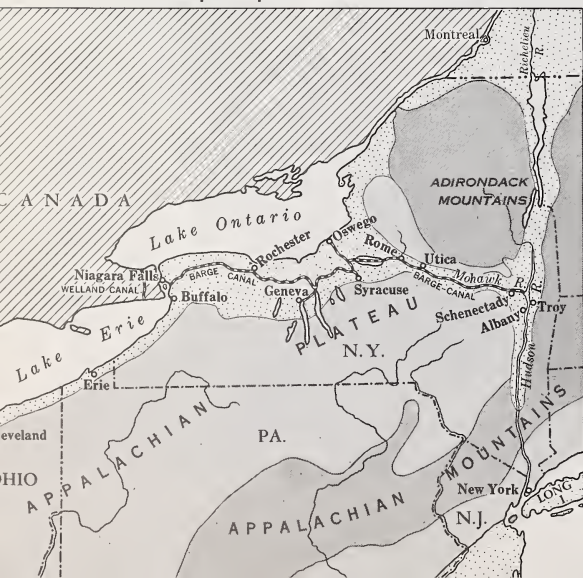
beaches of coast resorts; farmers on the more level lands; lumbermen in the Adirondacks; miners in the coal regions; and fishermen and seamen in ports or off the coast. This region, like New England, has a great variety of occupations, because there are differences of soil, land surface, climate, and resources.

Ways through a mountain barrier • Locate the Appalachian Highland on the map on page 192 and notice that it stretches for many miles between the Atlantic coast, the Central Plains, and the Great Lakes. This highland was a serious barrier to the early settlers who lived along the coast of New England and the Middle Atlantic States. It cut them off from moving westward.

Fortunately the settlers found one excellent way through the barrier. Find New York City and the Hudson River on the map on this page. Notice that the Hudson occupies a valley running north and south. Follow this valley northward into Canada. This is often called the Hudson-Richelieu route. Suggest a reason for this name. Notice that Lake Champlain forms part of this route. Before the days of the white man, the Indians used this trail. Today it is one of the busiest valleys in the world. Railways, roads, canals, and even aeroplanes follow it. The Hudson itself can be used by good sized steamers as far as Albany, and by a canal northward from there smaller boats can reach Montreal. From the map on pages 208-209, find the distance between New York City and Montreal by using the scale of miles.

Just north of Albany a tributary flows into the Hudson from the west. Find it on the map on this page. The valley of this river has also made history, for it is the easiest route from the Middle Atlantic States toward the Great Lakes and the western plains. It is so low and easy to follow that it is often called the "water level route." At one rather narrow point, called the Mohawk Gap, there are many transportation routes within this valley.

The Barge Canal Belt across New York State and the principal cities of that belt.





New York Central System

Transportation routes in the Mohawk Valley: a railway, a highway, and the New York State Barge Canal.

Study the picture above to see how many you can find. From the map on page 198, notice that this valley separates two areas of upland. What are their names?

The Mohawk Valley became famous more than a century ago because a canal was built through it to link the Hudson River with Lake Erie. It was then known as the Erie Canal, but the name was later changed to the New York State Barge Canal. Along this canal route, which runs from near Albany to near Niagara Falls, many large industrial cities have grown up. Locate four of them on the map on page 198. Is Buffalo on the canal? Although railways and roads have taken much of the traffic from this waterway, it is still used for heavy cargoes that are not needed quickly — grain, iron ore, coal, etc.

The Atlantic Coastal Plain • On the map on page 192, locate the strip of lowland, or

coastal plain, that stretches all the way from Cape Cod to southern Florida. This plain was once a part of the ocean floor but was lifted up to become dry land. In contrast to the mountains, hills, valleys, and rocky shoreline of New England, this area is low and almost level, with shallow water offshore.

The coastal plain has many advantages for farming. The growing season is long and the land is level. The soil is generally sandy, with some areas of clay. It was never very fertile and long use has made it even poorer. However, it is light, easy to cultivate, and well suited, when fertilized, for growing vegetables and some fruits. There are millions of people nearby in cities and towns willing to buy the produce, and excellent roads and railways lead to more distant markets in the north and west.

From Long Island southward, therefore,



Newport News Shipbuilding and Drydock Company. Nixon Photo

*Important shipyard
at Newport News.
Note the many ships,
including
an aircraft carrier,
under construction
and repair.*

the plain is an enormous truck-farming region, where thousands of people are kept busy growing cabbages, lettuce, tomatoes, potatoes, onions, spinach, strawberries, melons, and other crops. In the southern part of Virginia, there are also fields and fields of peanuts. Some of the vegetables and fruit are shipped directly to city markets, others are sent to factories for canning, and much is quick frozen.

The coastal plain is not an important manufacturing area and has few large cities. There are some industries, however. Because of the truck farms, there are large canning and freezing factories and other plants manufacture the fertilizer so greatly needed to improve the soils. The local sand and clay are used for making glass and pottery, and seaports like Norfolk and Newport News are important as shipbuilding centres.

Along the outer coast of the plain, fishing is carried on, usually in small villages, some of which are on offshore sandbars. Oyster farming is famous on Chesapeake Bay. The many miles of beautiful level sands have also become one of America's greatest playgrounds. There are many coastal resorts, the

most famous being Atlantic City, on the coast of New Jersey.

The Piedmont • Study again the landforms map on page 192 and locate the Appalachian Highland. Notice that to the east and west of this mountainous area there are uplands. On the east this upland, lying between the Appalachians and the Atlantic Coastal Plain, is known as the *Piedmont*, a word which means "at the foot of the mountains." Which states include part of this Piedmont? Here the land is neither mountainous nor level, but is rolling and hilly, with much hard rock appearing through the soil.

There are many apple orchards on the hillslopes of the Piedmont, and corn is also very important. But the most famous crop of this region is tobacco, which has been produced in Virginia since pioneer times. In this state and its neighbour, North Carolina, tobacco is the great cash crop.

In summer the big leaves of the tobacco plants make the fields look bright green. The leaves ripen a few at a time on each plant and must be picked as they ripen. They are then either hung on racks in a shed to dry out, or are dried by the heat from fires. In

both cases this is called "curing." The picking, weeding, curing, and other work keep the tobacco farmer and his family very busy. The farmer must be sure, too, to keep his fields well fertilized, for tobacco plants use much food from the soil.

As you would expect, the manufacturing of tobacco products is an important industry in the region. Factories for making cigarettes, cigars, and pipe tobacco are located in cities not far from where the tobacco is grown.

The fall-line belt • Many rivers run down from the Appalachians and across the Piedmont and the coastal plain into the sea. At the place where they leave the hilly Piedmont there are often falls or rapids. For this reason the line between the coastal plain and the Piedmont came to be called the *fall line*. As the waterfalls can be used to provide power for machines in factories, cities have grown up near them. Trenton, Philadelphia, Baltimore, and Richmond are all fall-line cities. Find them on the map on pages 208-209.

Three great cities • Some of the largest, best known, and most important cities of the United States are in the Middle Atlantic States. Among them are New York City and Philadelphia, which are first and third in size in the country, and Washington, D.C., which is the national capital.

New York City. To anyone who has never visited a really large city, New York is almost unbelievable. It seems impossible that more than eight million people are crowded into such a small area, and that twelve million or more live in the city and nearby.

There must be very good reasons for the growth of such a huge city at this place. Most important of them is the harbour, which is large and well protected from storms. Unlike Montreal's harbour, it can be used by shipping throughout the year. New York also has the best route inland, along the Hudson Valley towards the north and west. This route has enabled the city to grow much



By courtesy of Liggett & Myers Tobacco Company

A tobacco field in the Piedmont. The truck at the right is carrying hogsheads of tobacco to market.

faster than Boston, although Boston's harbour is almost as good as New York's. Because of its size and location, New York has also become the most important air centre in the country, and its huge airports are continually being made larger to handle the passengers and freight from at home and abroad.

The photograph on page 202 shows only a part of greater New York. The centre of the city is on Manhattan Island, and this explains why so many of the buildings are very tall — so tall that the name "skyscraper" was invented for them. What reasons can you suggest why such high buildings are found in New York City?

These falls in the Potomac River are among those which give the fall line its name





Miller Services Ltd.

An air view of Manhattan Island and part of New York City. The Hudson River is on the left.

Besides being a great sea and air port and a meeting place of roads and railways from all parts of the country and Canada, New York is also the largest manufacturing city in the United States. Because space is scarce, most of the industries do not produce heavy products like iron and steel, but light ones such as clothing, food, printed books, refined petroleum, chemicals, and other goods very valuable and not large or heavy. The clothing industry is carried on right in the centre of New York and gives work to more than two hundred thousand people.

New York is also a great tourist centre. Hundreds of thousands of visitors go there every year to attend its theatres, tour the United Nations headquarters, see the museums and art galleries, shop, and enjoy the many other attractions the city offers.

Philadelphia. Philadelphia was planned to become a large city nearly three hundred years ago, when William Penn laid out its

broad streets and large squares on what was then a wooded slope on the banks of the Delaware River. He wanted his "City of Brotherly Love," as the name is translated, to be not only large but beautiful.

Today the city is a centre of commerce, of education, and of industry. The Delaware River has become a very busy harbour for ships from many lands. On its banks there are countless industries. Among them is shipbuilding, for this stretch of the Atlantic coast is the most important shipbuilding region in North America. In recent years new steel mills have been built on the Delaware. They use coal from inland and iron ore brought in giant ore carriers from overseas — from Venezuela, Quebec, and elsewhere.

Philadelphia and other cities nearby produce about one-tenth of all the goods manufactured in the United States. These goods include almost everything, from loco-

motives and heavy machinery to synthetic fibres for making cloth.

Washington, D.C. Unlike New York and Philadelphia, Washington is not a manufacturing city. It is the capital of the United States, just as Ottawa is the capital of Canada. In it are the Capitol, or houses of parliament, and the White House, the home of the President.

Washington is not located in any of the states, but is in what is known as the *District of Columbia*. This area was originally a part of the State of Virginia, which was set aside as a separate region or district to be used as the centre of government of the country. As time passed, more room was needed and there are now many government offices in nearby parts of Virginia and Maryland.

Washington is a very beautiful city, with wide streets, fine buildings, many parks, and national monuments such as the Lincoln Memorial. It has been carefully planned to make it worthy of its place as the capital city of a great nation.

The Appalachian Mountains • These mountains are not one single long range, but several separate ranges with narrow valleys between them. Notice on the map on page 204 the location of the Blue Ridge Mountains, which are the highest in the eastern part of the United States and have beautiful wooded slopes. Find also the westernmost ridge, the Allegheny Front.

The map also shows that near the middle of the Appalachians there are several rivers flowing north and south along a broad, beautiful valley known as the Great Valley. This valley extends from New York State to Alabama and is very important as a fairly low route for roads and railways. On its rather level floor are some fine farmlands, used mainly for mixed farming, for dairying in the north where there are large cities needing milk, and for producing hogs, beef cattle, corn, and wheat farther south.



Miller Services, Limited

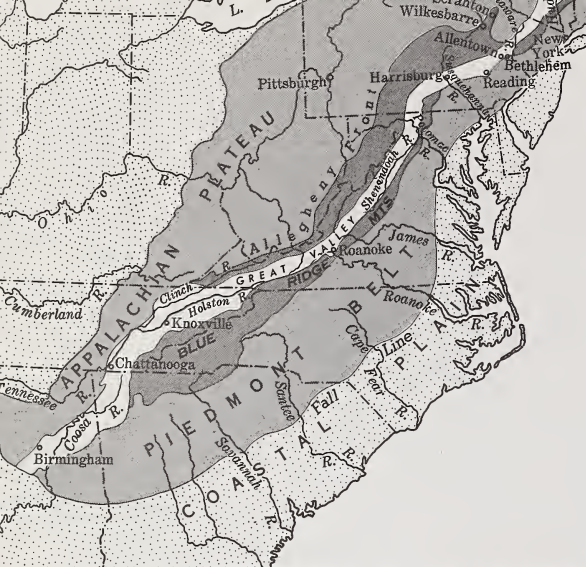
Washington, D.C., the capital of the United States. In the centre of the picture is the Capitol, where the government meets.

The soil of this Great Valley is rich because it is formed from limestone rocks which provide minerals for the plants. Limestone is also a raw material for making cement. In the northern part of the valley, in Pennsylvania, there are many cement plants which produce the materials for buildings in the large cities and for fine broad highways.

A peaceful barnyard scene on a dairy farm in the northern part of the Great Valley.

By Ewing Galloway, N. Y.



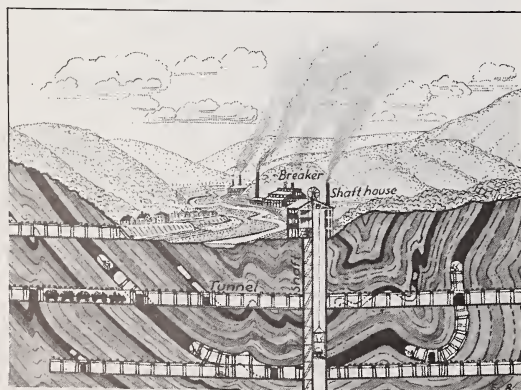


This map shows the extent of the Appalachian Mountains region and of regions which border it.

As you will remember from reading about the great steel works at Sydney, Nova Scotia, limestone is used with coal or coke for smelting iron. Coal and iron ore are both found near the Great Valley. With limestone at hand too, an iron-smelting industry has developed. There are also great iron and steel works in the valley, one of the largest being at Bethlehem in Pennsylvania.

If you travelled northward through the valley you would find near Scranton and

A diagram showing how mining is carried on in an anthracite-coal mine.



Wilkes Barre a cluster of towns small and large. This is the centre of the hard-coal mining region. Hard coal is also known as *anthracite*. It burns with very little smoke or ash. Much of this coal is shipped from Pennsylvania to Ontario and Quebec.

The Appalachian Plateau • If you were to fly over the Appalachian Plateau, you might think you were crossing a region of many hills and valleys and wonder why it is called a plateau. This hilly region that lies west of the Appalachians is so called because at one time it was a high level region. Since that time the many streams crossing it have cut deep valleys, changing it to a hilly upland.

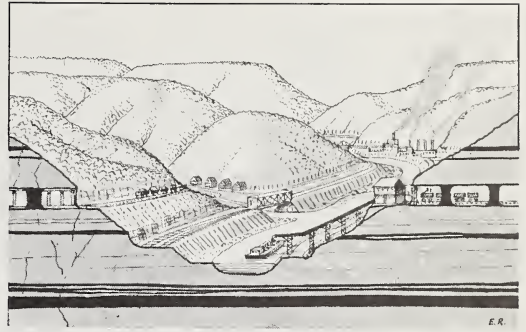
Coal resources. Near the northern part of this plateau stands the city of Pittsburgh. Find it on the map on this page. Close by there are many towns and villages, particularly along the rivers that meet at the city. They exist because there are seams or layers of coal deep in the plateau and the settlements are where coal miners make their homes.

The coal found in this region is soft, or *bituminous*, coal. This soft coal is not difficult to mine because the many streams have exposed the seams while cutting their valleys. The diagram on page 205 explains how this aids in mining. The coal of Pennsylvania and West Virginia is a valuable product and important to very many industries. One reason for its value is that some soft coal can be made into coke, which is needed in the iron and steel industry. Some of the coal of the Appalachian Plateau is exported to Western Europe from ports on the coastal plain. Some reaches Canada.

When you think of this region, try to picture coal in railway cars moving along the tracks which follow a river; coal in huge barges drawn or pushed by puffing tugboats; coal miners going by, weary from their hard work in the mines; rows of miners' dingy houses along the bottom of a valley.

Pittsburgh. On the point of land where the Monongahela and Allegheny rivers join to form the Ohio, there was once a French trading post known as Fort Duquesne. The Ohio provided one of the few good routes westward to the Central Plains, and so the settlement grew in importance. In time the town of Pittsburgh was built, and because of its good location and the wealth of coal nearby, it continued to grow until now the city, together with its suburbs, is the home of more than a million and a half people.

What do all these people do? One of the oldest and most important local industries is steel making. There are coal and limestone nearby to supply the industry, but the iron ore must come from mines near Lake Superior or from Labrador. Fortunately the Great Lakes provide a fine shipping route, and there are excellent railways, rivers, and canals to carry the ore the rest of the way. In return, Pittsburgh ships out coal and many finished products of steel.



A diagram of a soft-coal-mining valley. Compare this with the diagram on page 204.

Oil and natural gas. The Appalachian Plateau not only produces very valuable coal, but it was also one of the first regions on the continent to produce oil and gas. Its wells have continued to supply oil for more than a century. Some of the oil is shipped out by tank cars on the railways and by tank trucks, but most of it goes through pipe lines that link the oil field with distant markets. There is now a network of such pipe lines covering

Pouring molten metal into moulds to form ingots in a Pittsburgh steel mill.



much of the United States. The gas, too, travels underground by pipe lines, supplying cheap fuel and lighting for a large area.

The Canal Belt • You have already read, on page 199, about the line of cities that grew up along the New York State Barge Canal that links the Hudson River and the Great Lakes. Although the canal is not so important as it once was, the cities near it have grown rapidly because they have excellent road and railway connections. Most of these cities are manufacturing centres. Rochester is famous for making cameras, Schenectady for electrical goods and locomotives, Syracuse for shoes and typewriters, and there are many other cities, each with large and small industries.

Buffalo. Near the western end of the Canal Belt is Buffalo, a large industrial city. Why do you think it is called the “Gateway of the West”? Look at the map on this page, and you will see that Buffalo is not only at the

western end of the Canal Belt, but that it is a port on Lake Erie and has rail connections with all the central part of the United States.

Buffalo has many important industries because of its location. Wheat from the West is ground into flour. Coal from the Appalachians and iron from Lake Superior supply mills and factories making iron and steel products. Cheap electricity comes from Niagara Falls.

THINGS TO DO • 1. How many of the following can you name? Locate each on a map.

- a. The largest city in North America.
- b. An important coal-mining centre on the Appalachian Plateau.
- c. The capital of the United States.
- d. William Penn’s city on the Delaware River.
- e. A seaport on the Atlantic Coastal Plain.
- f. A city that grew on the site of Fort Duquesne.
- g. A city on the Mohawk-Valley route West.
- h. Two rivers that join to form the Ohio.

The railway lines and principal railway centres of the United States.





Buffalo Chamber of Commerce. Fitzgerald Airphoto

Buffalo and part of its harbour. The business section is in the centre foreground.

2. Explain the meaning of the following terms: (a) coking coal; (b) coal seam; (c) oil pipe line; (d) anthracite; (e) plateau; (f) fall line; (g) Great Valley; (h) Canal Belt.

3. From time to time young men from Montreal paddle canoes to New York City. On a map, trace the waterways they follow on their 400-mile journey. If they return home by air, would they probably fly over the same route?

4. On a map locate as many railway lines as you can that link the St. Lawrence Valley with New York City. Then look at the map on pages 208-209 to find if they all follow valleys. What is your answer?

QUESTIONS TO ANSWER • 1. You have read that many people leave the crowded cities of the eastern United States to vacation in New England. Where might they also go for vacations in the Middle Atlantic States? You will need to use the map on pages 208-209, showing the location of hills and mountains as well as cities.

2. It has been said that the most important reason why New York City grew rapidly a hundred years ago was because the Erie Canal was built. Why did this make so much difference? What other means are there besides the canal for carrying freight and passengers by the water-level route?

3. Why has the Great Valley many railway routes and fine highways?

4. New main roads have been built westward from Philadelphia and New York City. The latter is called the "New York Thruway," the other is the "Pennsylvania Turnpike." One of them follows the water-level route and has no tunnels, the other has several tunnels. Can you explain the difference? Look at the map on pages 208-209. What kind of land lies west of Philadelphia?

THE SOUTH

A third group of states is very different from both New England and the Middle Atlantic States. It is the Southern States, usually simply called "The South." It is different because both its geography and its history have been unlike that of the states of the Northeast.

There are eleven Southern States — North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Tennessee, Louisiana, Arkansas, Oklahoma, and Texas. Locate them on the map on pages 208-209. Notice that seven of them are east of the Mississippi River and four are west of it. The names of



Cities over 1,000,000

Cities of 300,000-1,000,000

Selected cities under 300,000

National Capitals

State Capitals

SEA LEVEL

BELOW SEA LEVEL

MAP SCALE: ABOUT 220 MILES TO ONE INCH

0 100 200 300 400 500

UNITED STATES

POLITICAL-PHYSICAL



these states are interesting. With the help of an encyclopedia try to discover which were Indian names, which one was Spanish, which were English, and which French. Some of the states were named after rivers. Can you find two of these?

On the map on pages 208-209, locate the northern limit of the Southern States. Then notice how far south Texas and Florida extend. They reach almost to the tropic of Cancer. As the sun shines from almost overhead there at the end of June, summer days are very hot. They may also be very damp. Even in winter these southernmost states remain warm, with no snow or ice and only very rare frosts. For these reasons we shall find crops growing there that cannot be grown in Canada.

MAP STUDIES • In working out these exercises, use the maps on pages 192 and 208-209.

1. Trace the Atlantic Coastal Plain southward from Virginia. Through how many Southern States does it extend? What are their names?

2. Find the Gulf Coastal Plain. It is also an almost level lowland. What are the four states it crosses?

3. Which of the Southern States border on the Mississippi River?

4. Parts of four Southern States are within the Piedmont. What are their names?

5. Find the mountains in North Carolina. One of them, Mount Mitchell, is several hundred feet higher than Mount Washington in New Hampshire, and so is the highest peak in the United States east of the Rockies.

6. The Tennessee River is a tributary of the Mississippi. Trace its course as it flows through the Great Valley and then cuts across the Appalachian Plateau. We shall read later about important power stations along this river.

7. The largest state in the South is also the largest in the United States. Which is it? What foreign country does it border? On pages 240 and 241, find out whether this state is larger than Quebec. How many Canadian provinces are larger than Texas?

Cotton and the Cotton Belt • Cotton is still by far the most important of all fibres, even though many different synthetic fibres are now made. The United States exports more cotton than any other country in the world, and most of this is from the South.

Cotton will only grow where the climate is suitable. On the map on page 221, find the large area marked as the Cotton Belt. This does not mean that all the land there is used for cotton, but it does mean that very little cotton is grown outside this area. On the north the growing season becomes too short, for cotton needs 200 days in which to grow and ripen. On the south the weather in the fall is too wet, and so would ruin the harvest. To the west there is too little rainfall. The cotton fields would have to be irrigated, and this would make it too expensive. To the east there is no limit due to weather, but here the soil has been damaged by long use; also, this area has many *boll weevils*, insects which destroy the cotton. Cotton grows best on the "bottom lands" near the Mississippi and on a belt of rich, black soil in Texas.

Now let us learn something about how this very important crop is produced.

The cotton plant grows to a height of about two feet. It has a flower, something like a hollyhock, which may be white or yellow and which later turns pink and finally red. This happens in late June or early July. After about three days the flower falls off and a small, pea-sized pod remains which in the next forty or fifty days grows to be a boll about the size of a walnut. When the boll is ripe it bursts, showing a ball of fluffy white cotton *lint*.

From the time the fields are first ploughed in February until the last crop is harvested in December, cotton requires a great deal of care, and much of the work is done by hand. First the seeds are planted close together in rows, but when the little plants come up they must be thinned out with a hoe. This is called

cotton chopping. During the long moist summer days the weeds must be kept down by cultivating and hoeing. Once the bolls have burst in August, every man, woman, and child is busy in the fields picking the crop. Most cotton picking is done by hand, usually by Negro workers. Some of the very small farms are owned by Negroes, and some farms are rented by Negroes from owners most of whom are white. The largest farms, or *plantations* as they are called, are owned by white people who employ Negro workers. On the very large plantations much of the cotton is now picked by machine.

After the cotton has been picked, it is not ready for the market until it has been cleaned of seeds and other materials. This is done in a *cotton gin*, a machine which separates the cotton lint from the seeds and pods. The cleaned cotton is then pressed into big bundles or bales weighing about 500 pounds each. These bales are wrapped in sacking and bound by metal bands. In cities such as Memphis, Tennessee, there are many warehouses where these bales are stored until they are sold, or until they can be shipped by rail or river boat to New Orleans for sale there to overseas customers.



U.S.D.A. Photograph by Forsythe

A bale of cotton leaving the gin. What was done to the cotton while it was at the gin?

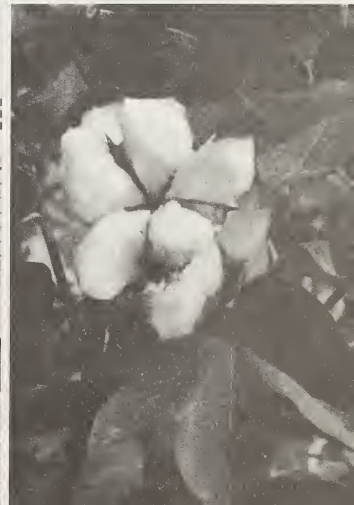
Very little of the cotton harvest is wasted. After the lint has been removed, the hulls are treated to remove the remaining poor lint, or *lintners*, which can be made into lampwick or twine. The hulls themselves are used to feed cattle, and the seeds are pressed to squeeze out the cotton-seed oil. Even the stalks can be used to make rough paper or paper boards.

Many changes are going on in the Cotton Belt. It is now far from being a "one-crop" region. Much of the land is now used for livestock, corn, wheat, soybeans, sweet

A mechanical cotton picker at work. This machine can do the work of many people. To the right, a cotton boll.



Imperial Oil Limited





*Harvesting oranges
in Florida.*

potatoes, rice, and tree-fruits such as peaches. There are a number of reasons for the change. Much of the soil was ruined by continuous cotton-growing, and other crops — or no crops at all — took the place of cotton. The price of cotton fell so low that it proved more profitable to use the land for other purposes. Then, too, many of the southern cities grew in size as more industries were built. This increased the need for food, and cotton land was taken for food crops.

Food from the South • We in Canada, and cities in the northern United States, import peaches from Georgia and grapefruit and other citrus fruits from Florida. We also obtain fresh vegetables from the South when our own crops have not yet been harvested.

Rice. Much of the rice we use in Canada comes from the southern part of the United States. We usually think of rice as the important crop of countries in Asia, and so it is; but it also grows very well along the moist coast of Louisiana and nearby Texas.

In most parts of the world, growing rice is an unpleasant and back-breaking job. Rice needs a great deal of water, and you have probably seen pictures of Japanese farmers, standing ankle deep in mud and water in the

hot sun, bending over their rice plants. In the United States, machinery has taken much of the hard work out of rice growing. The seeds are sown by a machine drill, or sometimes from an aeroplane, in dry or moist ground. When the plants have sprouted, the fields are flooded, and are then allowed to drain gradually. By the time the rice plants have turned yellow and the grain is ready for the harvest, the ground is dry and firm enough again to bear the weight of combines which cut and thresh the rice much as is done with wheat on the Canadian prairies.

Sugar. In Louisiana, particularly along the lower Mississippi, sugar cane is grown. Sugar cane is a tall plant that looks much like corn and contains a sweet juice. Small southern children are sometimes given a piece of sugar cane to chew instead of candy.

The plant is grown not from seed but from joints of the stalk which are planted in rows about six inches below the ground. When the new tall stem has grown and is ready for harvest, the leaves are cut off and the canes are chopped down, tied into bundles, and sent to the sugar mill. There the cane is crushed between rollers to take out the juice which contains the sugar. White sugar is

made by boiling and then refining this juice. Molasses is also made from sugar cane. It is the liquid that is left when the sugar crystals form during the refining process.

Tobacco • You may remember that we saw tobacco growing in the southern part of Virginia, and that earlier we had read of its being grown in the Connecticut Valley and also in Southern Ontario. The most important region of all for growing tobacco is in the Carolinas and in Georgia. West of the mountains the crop is also found in Tennessee.

Forests and forest products • At one time what is now the Cotton Belt was an immense area of forest, but the trees were long ago cut down to make way for farmlands. Some forested areas were not used for farming, and some of the farmlands lost so much good soil through over-use and abuse that trees were allowed to grow there again.

Today the South is one of the regions of the United States most noted for forest products. On the sandy soils of the coastal plain there are usually pine trees. This area of yellow pine is called the southern pine forest to distinguish it from our own northern forests. The value of these forests is increasing all the time as farmers and governments take better care of them.



New Orleans Chamber of Commerce

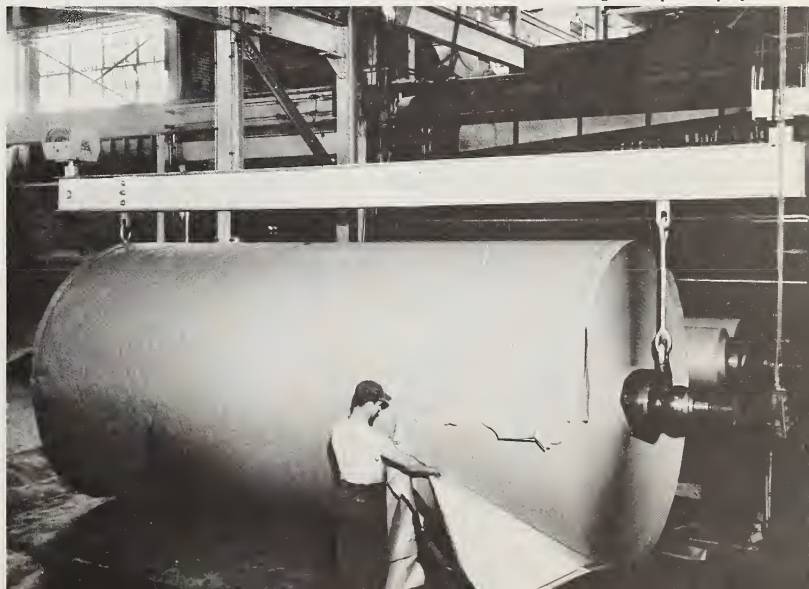
Harvesting sugar cane near New Orleans. Notice how high the cane grows.

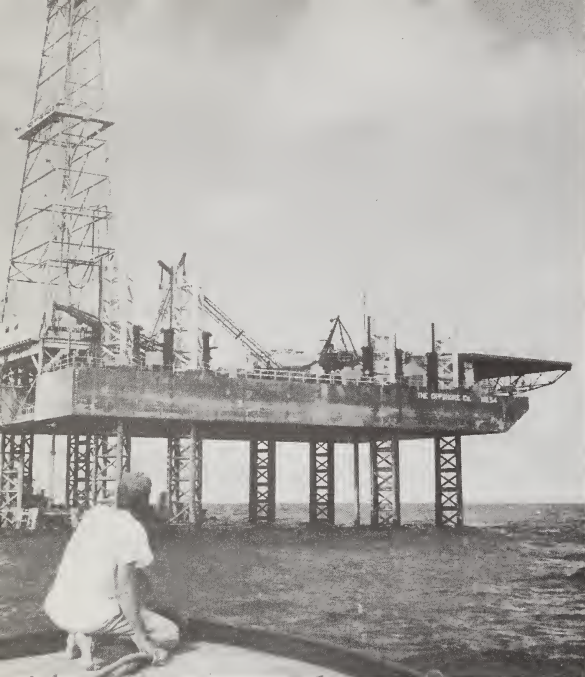
Almost one-half of the lumber cut in the United States now comes from the South, and there is a large pulp and paper industry as well. Furniture making is another industry which uses southern lumber. In addition to these uses, the southern pines have for centuries been a source of turpentine and rosin. Turpentine is used in making paints and varnishes, and rosin is used in soap, paper, linoleum, and many other things.

A large iron and steel industry • On the map on pages 208-209, locate Birmingham in Alabama. This is an important steel produc-

Union Bag and Paper Company

This huge roll of paper, twenty feet wide, is being completed in a mill at Savannah.





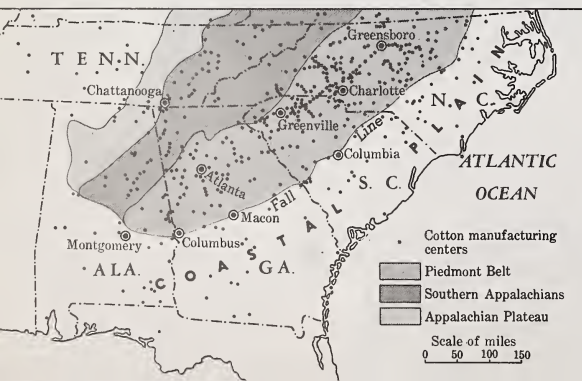
New Orleans Chamber of Commerce

An oil derrick in the Gulf of Mexico. The discovery of oil brought many changes to the South.

ing area, the only large one in the South. It is very fortunate in having both coal and iron close by, as well as the limestone in the Appalachians. These are the three minerals needed to produce iron from ore. As industries in the South grow and need more and more steel, the Birmingham blast furnaces will become even more important.

Southern oil fields • The United States is the world's largest oil producer, and more than

Each dot on this map of the Piedmont Belt stands for a cotton-manufacturing centre.



half of this oil comes from the southern states of Texas, Oklahoma, Louisiana, Arkansas, and Mississippi. By far the largest single oil field is in east Texas, where sandy land that was once worth very little suddenly became extremely valuable when oil was found there thirty years ago. At first the oil was produced recklessly; well after well was bored with no thought of conserving any oil for the future, and the methods used were often wasteful. Today care is taken to avoid waste, and the amount of oil that may be produced each day is now controlled by the government.

What becomes of all this oil? Some of it is taken to refineries in tank cars, but most of it is pumped through underground pipe lines. Some of these go as far north as the shores of Lake Michigan and Lake Erie, and one reaches Sarnia in Southern Ontario. Natural gas from these southern fields is pumped through other pipe lines as far as New England in the Northeast. The oil industry has brought many other industries to the South. There are seaports where the oil is shipped either overseas or to ports along the mid-Atlantic coast. There are plastic and other industries that use the waste products from oil refining, and there are still other industries that make the pipes, pumps, and other equipment used at the oil fields.

Sulphur • Do you remember the large piles of yellow sulphur we saw at the paper mill in Quebec? Some of this sulphur comes from deep in the ground in Louisiana. It is used to make the sulphite chemicals needed in making paper.

Manufacturing • In the early days the South was not an important industrial region. Most of the manufactured goods its people needed were imported from the northern states, particularly Pennsylvania, New York, and New England. Within recent years there has been a remarkable change, and there are now many important industrial cities in the South.

The first factories made use of local pro-



Photograph by Thigpen

A busy textile mill in Alabama. There is room here for workers' houses, and for expansion of the mill when needed.

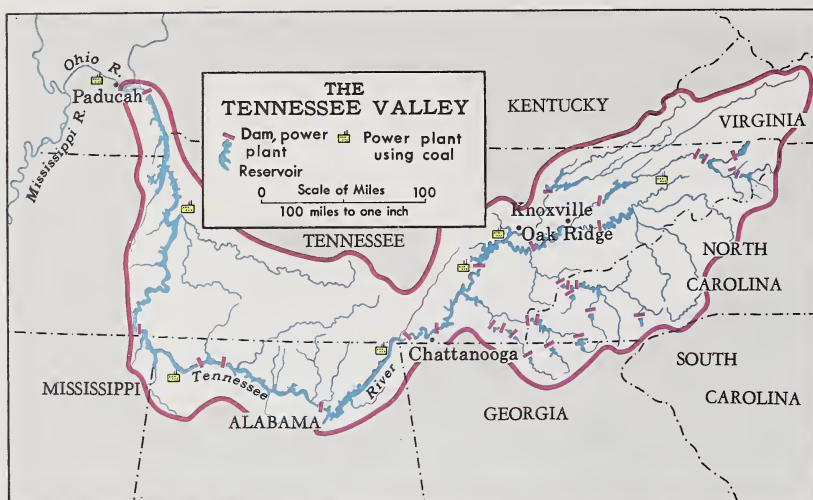
ducts like cotton. Notice the location of the dots representing cotton factories on the map on page 214. For many years the New England States did most of the cotton manufacturing for the whole country, but now they rank second to the South in this industry. Why has this southern Piedmont area been able to surpass the older textile district of New England? There are many reasons, some of which are: (1) it is in the Cotton Belt, where the raw material is produced; (2) there is plenty of water power provided by streams flowing from the Appalachians; on them many hydro-electric plants have been built; (3) the climate is milder, and factories and homes do not need to be heated in winter; (4) the labour is cheaper because wages are not so high as in the North; (5) the northern cotton mills were old and their machinery was often out of date, while the southern mills are modern and can produce cloth more cheaply.

Soon other industries began to come to the

South. Some of them we have mentioned already. They include paper mills, furniture factories, the oil industry, and the manufacture of plastics. Remember also that there are millions of people living in the South who need food, clothing, and many other things. Many of these needs are now supplied by factories near where the customers live.

When we study the Pacific Northwest, we shall learn about the aluminum industry there, just as we have already studied it in Quebec and British Columbia. This industry is also growing rapidly in the South. The factories are located in east Texas. Some of the ore needed in this industry is mined in the South, but most of it is brought in by ship across the Caribbean from South America. The power needed is produced from local oil and gas.

The Tennessee Valley Authority • Locate the Tennessee River on the map on pages 208-209. About twenty-five years ago the United States Government found that conditions in



A diagram of the
Tennessee Valley
Authority.

the land drained by this river were very poor indeed. More than half of the two million people living in the drainage area of the river were farmers, and their land had suffered greatly from erosion. This was because the forests had been cut down and the soil had been allowed to wash away into the streams.

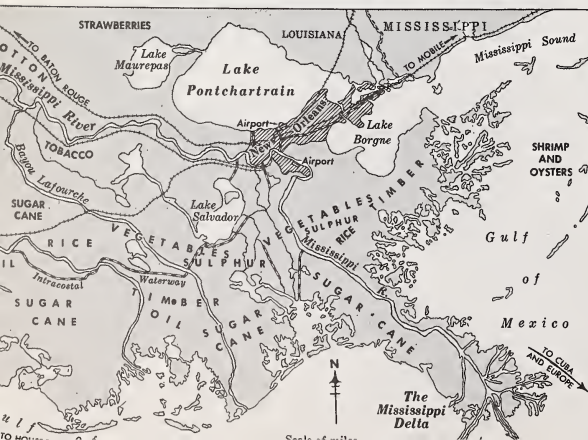
The government believed that the whole region could be made better if care were taken of the river and its tributaries. So the Tennessee Valley Authority, usually known as the T.V.A., was set up in order to make better and greater use of the resources of this 40,000 square miles and to improve the lives of the people there. Many large dams were

built on the river, both to prevent floods and to produce electric power. The bare slopes of many hills were reforested. Can you suggest why this was done? Parks were laid out around the large new lakes which were formed by the dams.

In time many industries and several new towns were built close to the power stations. Large barges now carry along the Tennessee River cargoes of oil, steel, coal, lumber, and thousands of automobiles. Visitors from many parts of the world visit this now prosperous region in order to learn all about T.V.A.

The Mississippi Valley • "Mississippi" is an Indian word which means "big river." Do you think this is a good name for it? On the map of the United States on pages 208-209, try to follow with your finger the outline of the *drainage basin* of the Mississippi. To do this you must keep just beyond the headwaters of all the rivers which drain into the Mississippi. You will discover that the drainage basin stretches eastward to the Appalachians, westward to the Rockies, and northward almost to the Great Lakes and actually into Saskatchewan and Alberta. The total area is about 1,250,000 square miles — about the same as that of Quebec, Ontario, and Manitoba together.

New Orleans and its surroundings. What does the map tell you about the city's industries?



From all this great drainage basin, water is flowing constantly downstream toward the sea. With it goes soil washed from farms and other lands. From the city of Cairo in Illinois, where the main stream of the Mississippi is joined by the Ohio, down to its mouth on the Gulf of Mexico, the land on both sides of the river has been built up of materials carried there by the water. This broad *flood plain* has deep, fertile soil, but it is of course likely to flood when the river is unusually full of water. Then floods pour down the valley, sometimes breaking through the banks and causing terrific damage to cities, farms, crops, and livestock. To try to keep the water under control, engineers have built *levees*, or raised banks, on each side. These levees, like the dikes in the Netherlands, must be watched constantly to see that there are no breaks through which water could pour into the low farmlands behind them.

Before the railways were built, the Mississippi was the main north-south "highway" in the United States. Its steamboats carried passengers and goods. When the railways were built, much of the river traffic was given up. Later the channel was deepened

and straightened all the way from St. Paul in Minnesota to the sea, and the same thing was done on the Ohio River as far up as Pittsburgh. We have read how the Tennessee was improved too. Now river traffic is again important, and long lines of barges, moved by tugs, carry oil, cotton, coal, and other goods between the large industrial cities of the Mississippi Valley.

BOOKS TO READ. If you are interested in the old days along this mighty river, read the books of Mark Twain, who was once a steamboat pilot on the Mississippi River. *Tom Sawyer* and *Huckleberry Finn* are two you would enjoy.

New Orleans. In the early days the Mississippi Valley belonged to France. The French reached it from the north by way of the Great Lakes, and at the south they built New Orleans. The city is located about a hundred miles upstream from the river mouth. Notice on the map on page 216 that it lies on a bend of the Mississippi, between the river and Lake Pontchartrain, which is really a part of the Gulf of Mexico.

Ships from all over the world load and unload at the New Orleans wharves. Some

The city of New Orleans on its flat mud plain. Notice the modern river boat and the string of barges being pushed by a powerful tug.

New Orleans Chamber of Commerce. Leon Trice Photo



of the imports are used in the city itself, but many go by train and river barge to other parts of the South and even to more distant parts of the country. The exports include products of every part of the Mississippi Basin, for New Orleans is the great Gateway of the South and of the whole Mississippi Valley. Like most ports, New Orleans is also a manufacturing centre. It is well known too for its shipbuilding industry.

Other cities. Memphis has already been mentioned as a cotton centre. It is also important as a railway centre because a long bridge there crosses the wide Mississippi River. Much of the trade between the northern and southern states is handled in this city, and machinery needed in the Cotton Belt, such as that for picking cotton, is made there.

Several Texas cities have grown very rapidly in the present century. Two of them are Houston and Galveston, the greatest cotton-exporting ports in the world. They also export much oil. Houston is the largest city in the South. It is not actually on the seacoast, but is linked to the Gulf of Mexico by a canal. Galveston, which is much smaller

than Houston, is built on an offshore island which is now connected to the mainland by a bridge that carries railways and a highway. Why did Houston, which is farther inland than Galveston, become the larger port? Think of the reasons why Montreal became larger than Quebec and you will know the answer.

Atlanta, the leading city of Georgia, is an important railway centre. At this point the railways that run south along the coastal plain and the Piedmont are finally able to meet those which have been running south in the Mississippi Valley.

Many new industries have grown up along the Gulf coast of Texas and Louisiana, and this has led to rapid growth of the cities there. Some other coast towns are attractive for another reason — they serve as vacation resorts for people from the interior.

Florida, the tourist state • It would never do to leave the South without seeing Florida in wintertime. January in Florida is much like July in Nova Scotia, except that the sun and the sea water are warmer. Hundreds of thousands of visitors regularly travel from the northern states and Canada to winter in

The Houston Ship Channel, showing docks, industrial plants, and ocean-going ships.

Houston Chamber of Commerce



this pleasant climate, and many cities have been built to take care of them. Miami, together with the area surrounding it, has a population of almost half a million, although there are few industries there. The main industry is, in fact, the tourist industry.

Except along the coast, Florida's summer climate is not so attractive, for it is as hot as the tropics and very damp. The coasts are often cooler because of breezes from the sea.

QUESTIONS TO ANSWER • How many of these questions can you answer?

1. Where do the early peaches sold in the northern states and eastern Canada come from?

2. What is the leading iron and steel centre of the South?

3. From where do Canadian pulp mills obtain some of their sulphur?

4. From what two southern states can Canadian grocers buy their tomatoes in January?

5. Why is cotton not grown on farms north of the Cotton Belt?

6. What southern seaport is one hundred miles from the sea?

7. What southern city is a cotton market, a railway centre, and a home of factories that make cotton-picking machinery?

8. What do the letters T.V.A. stand for?

9. Which large United States river drains part of Alberta

GIVING REASONS • Give reasons why —

1. Visitors from the North flock to Florida in winter but not in summer.

2. The Mississippi is building its delta outwards into the Gulf of Mexico.

3. The South has become the leading cotton manufacturing area of the United States.

4. Cotton growing was given up in parts of the Piedmont.

5. Trees were planted on the hills in the Tennessee Valley.

MEANING OF WORDS • Write sentences to show that you understand the meaning of the following words: levee, bottom lands, boll, lint, lintners, cotton gin, erosion, fertilizer, tenant, boll weevil, drainage basin.

THE CENTRAL STATES

The thirteen Central States lie both east and west of the Mississippi River. To the east are Kentucky, Ohio, Indiana, Michigan, Illinois, and Wisconsin. To the west are Kansas, Missouri, Iowa, Nebraska, Minnesota, South Dakota, and North Dakota. Which of these states border on Canada? Which of them reach the shores of Lake Superior?

The Central States have not been settled so long as the eastern states. One hundred years ago this area was almost empty, yet today there are millions of people living on its farms and in the many large and small cities. What brought so many people to this region, and how do they make a living?

MAP STUDY • Turn to the map on pages 208-209.

1. Which states in the South border on these Central States?

2. What is unusual about the shape of the State of Michigan?

3. Most of the Central States region is level or rolling land, but there are four areas of highlands. Find these on the map.

Early exploration and settlement • As you read on page 217, the Mississippi River was first explored by the French. Father Marquette, the missionary, and Louis Joliet, a trader, reached it in 1673 and went southward to the mouth of the Arkansas River. Later, trading posts protected by forts were built to trade with the Indians for furs.

During the last quarter of the eighteenth century, English settlers from the Atlantic coast began to reach the Mississippi overland. Most of them travelled by way of the Cumberland Gap, a pass through the Appalachians in the southeast corner of Kentucky. The newcomers spread out over the forested lands of Kentucky, Ohio, Indiana, and southern Illinois. There they cut down the hardwood trees and harvested good crops,

for the soil was fertile. In time most of the forests were cut down and replaced by pasture or grain fields.

Some settlers moved farther west, into central Illinois and across the Mississippi. They found open prairies instead of forests, except where there was wooded land beside the streams. Few of them knew anything about farming such lands, but those who tried it were rewarded by excellent crops from the rich black soils.

As the news of their success went back east, more and more settlers flocked through the Cumberland Gap and along other routes to the newly settled plains. In time settlers pushed west and north beyond St. Paul, Minnesota, and were astonished to find that other pioneers were there ahead of them. These first pioneers had come south from the Red River Valley of Manitoba. The "Opening of the West" had really begun.

Rich food-producing lands • The Central States in time became the chief food-producing region of the United States. Here men learned to work in partnership with Nature, to use the fine soils and the good climate of the level and rolling lands to produce huge quantities of grain, meat, and other foods. This region has many advantages. The four most important are:

1. The surface of the land is generally level

or gently rolling. This makes it easy to plough, plant, and harvest by machinery.

2. The soils are rich and can produce large crops year after year.

3. The growing season is from four to six months long. This is enough to grow large quantities of corn and other crops which provide food for people and animals.

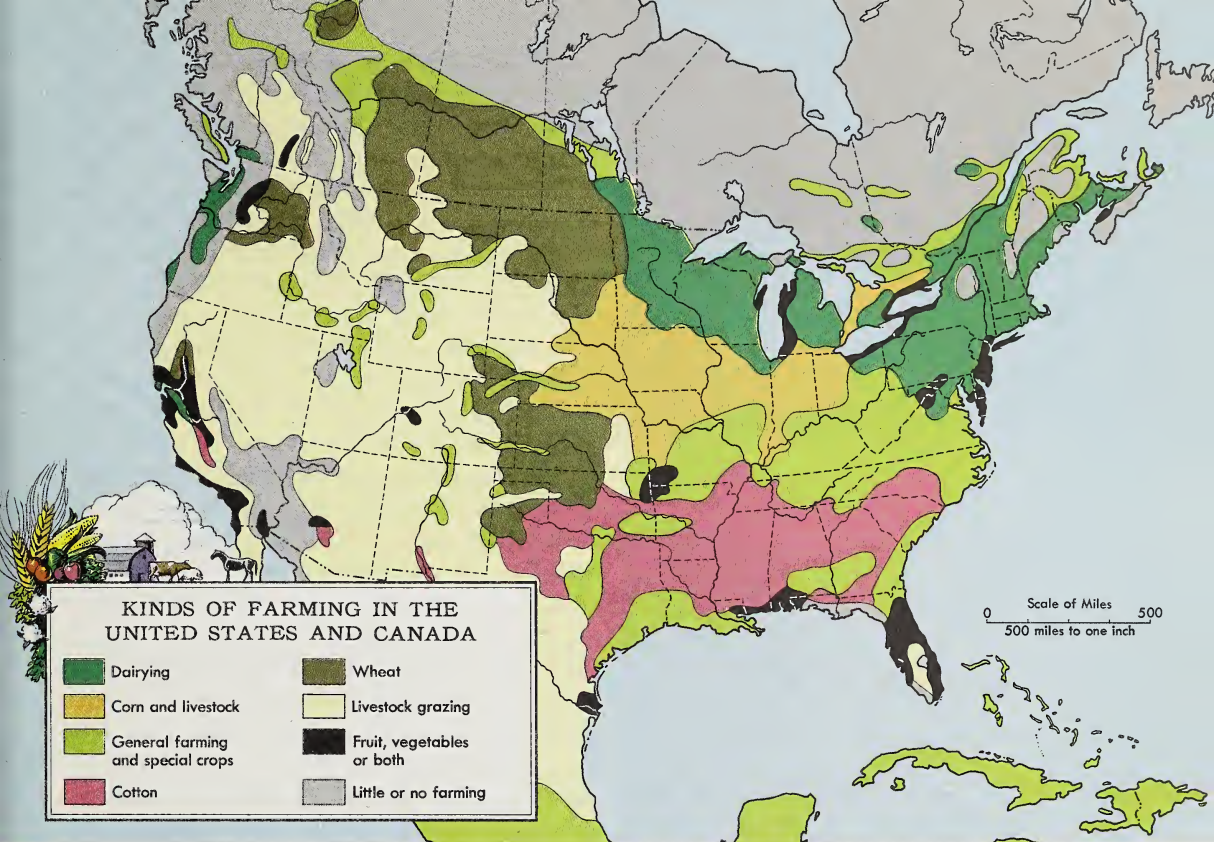
4. The yearly rainfall over most of the area is more than twenty inches, which is enough for most crops. Farther west there is less rain.

The Corn Belt • The richest part of the Central States is called the *Corn Belt*. Trace its limits on the map on page 221. This does not mean that corn is the only crop grown in this area, but it does mean that corn is grown on almost every farm and that it is the most important crop of the region. The United States produces more corn than any other country, and this area is the leading corn producer in the United States.

Why is the Corn Belt so favourable for growing corn? First of all, the climate is well suited to its growth. The hot summer days and warm nights send the corn shooting up several inches in twenty-four hours. Corn must have enough moisture and sun, and this is a region with frequent thunder showers — often at night — and plenty of bright sunshine. As we know, the soil is excellent, and



*Baling hay
on a dairy farm
in Wisconsin.
What conditions make
this a good region
for dairying?*



the land is level so that it is easy to cultivate. This must be done to keep down the weeds.

In the Corn Belt, around harvest time, we would see the crop standing well above a man's head. If we examined the roots we would find them going far down into the deep soil. This prevents the corn from being blown down by strong winds.

What else might we see at a Corn Belt farm? The first thing that strikes visitors from agricultural regions in other lands is that this is a prosperous area. There are well kept homes, large farm buildings, and fine farm machinery in good condition. There are, however, not many farm workers. The Corn Belt is the world's best example of farming done by machinery.

The farm home, we notice, has double windows like our houses do in Canada, for

winters here can be very cold. We see a row of trees to the north and west, planted to protect the house and barns from cold winter winds. They also help to prevent the soil from being blown away. Nearby are the corn cribs where the corn is stored after it has been husked.

The Corn Belt farmer is a very busy man. Not only does he work hard, but he must plan all the work very carefully. Every farm job must be done at the right time of year, the valuable machinery must be used wisely, and the land must be divided up among the most suitable crops. On a farm of 160 acres, there may be about 60 acres of corn and another 60 acres of winter wheat, oats, and hay. The remaining 40 acres may have soy beans, pasture, and a garden with vegetables and fruits for the farmer's own use.



J. I. Case Company



International Harvester Photo

Many machines are used in the Corn Belt. The first plants and covers the corn, the second cultivates the growing corn, and the third harvests the corn when ripe.

International Harvester Photo



On such a farm we notice the large number of livestock. The farmer explains to us that corn is a heavy crop and does not keep as well when transported as does wheat. Rather than ship the corn, therefore, it usually pays to feed it to the livestock and sell the animals. Beef cattle are often brought in from the drier grazing lands to the west, to be fattened here before they are shipped to the meat-packing plants farther east. Hogs are also fattened on corn. So the Corn Belt farmer sells his corn, but he does so in the form of valuable meat.

The Corn and Winter Wheat Belt • You may wonder what is meant by *winter wheat*. In our Prairie Provinces wheat is planted in the spring and harvested in the fall. It is known as spring wheat. Farther south in the Central States, where the growing season is longer and the winter is not so cold, wheat can be planted in the fall. The young plants spring up with the autumn rains until they are several inches high. Then the first frosts come and stop their growth. The roots continue to live under the protection of the winter snow. Once the ground has thawed in the spring, which is earlier than our spring, the wheat begins to grow again and it is ready to be harvested in July. There is a difference in the kinds of wheat produced in these two ways. Spring wheat is harder and generally makes a better quality of bread.

To the west of the Corn and Winter Wheat Belt, there is too little moisture for corn, and most of the land is used for winter wheat alone. In this more westerly area where wheat is the main crop, there are sometimes very dry years, when the dried-out soil turns to a fine powder and blows away in the high winds. For this reason, these farmlands of the Great Plains have been called the "Dust Bowl." Parts of the Canadian prairies, especially in southern Saskatchewan and southern Alberta, have been damaged in the same way. To protect their dry lands from

soil damage by winds, many farmers have now planted shelter belts of trees, not only near their houses as in the Corn Belt, but between the open fields as well.

SOMETHING TO REMEMBER • Corn is usually used to feed livestock, but wheat is sold to be shipped to centres where flour can be made.

The Spring Wheat Region • As we know, the Canadian prairies are one of the world's finest spring-wheat regions. This crop also extends southward into the northern part of the Central States. There, conditions are very much like those in the neighbouring parts of Canada. One of the richest spring-wheat regions is the Red River Valley of North Dakota and Minnesota. The rich black soils here also produce potatoes of high quality.

The Hay and Dairying Belt • To the north of the Corn Belt in the Central States, the nights are too cool for corn and the rainfall is too great for wheat. The cool, moist climate is excellent, however, for the growth of hay and other crops that can be fed to dairy cattle. For this reason, the area has become the best dairy-farming region of the United States. Part of this northern section is rough land, but that does not prevent it from being used for pastures, although it would be useless for growing grains.

Much of the milk is shipped for sale in the cities, but a great deal of it is made into butter and cheese, for which the region is famous.

A pulpwood region • There are two important forested areas in the Central States. One is to the north around the western Great Lakes, and the other is far to the south in the rugged country of the Ozarks. The best trees were long ago cut from these two areas, but the present growth gives smaller trees that are suitable for pulpwood. There are several very large pulp and paper mills in Minnesota not far from the Canadian border.



J. C. Allen & Son

A farm in the Hay and Dairying Belt.

Mineral resources • This rich farming area of the Central States is also well provided with minerals. Kentucky, Indiana, and Illinois especially have important coal fields. Kansas, Ohio, Indiana, Illinois, and Michigan are producers of oil and natural gas. These resources provide the Central States with a good supply of fuels to aid industry, as well as many products from the farms.

Perhaps the most famous mineral product of this region is the rich iron ore of northern Minnesota and Michigan. It has been one of the most productive iron-ore regions in the world. The largest mines are in the Mesabi Range lying west of Lake Superior.

In a visit to one of these mines, we see that it is really an enormously wide and deep hole in the ground. This, we are told, is an open-pit mine. Most of the mining here is done in this way because the ore does not lie very deep underground. After the covering of gravel, sand, and boulders has been pushed aside, it is not difficult to take out the ore, which is of very high quality.

We watch the huge electric shovels scooping the rich red rock out of the pit and pouring it either into large trucks or directly into freight cars. We are told that in this



*An open-pit iron mine
in the Mesabi Range.
Where else have you
read of such mines?*

mine alone there are over seventy miles of railway tracks. The ore cars are hauled to docks on the shore of Lake Superior. There they are run onto very high loading piers, like those at Port Arthur. From these the ore slides down into the holds of lake freighters.

Much of the best quality ore in this region has now been mined, and the blast furnaces of the United States are beginning to use ores brought into the country from abroad. We have already read that ore from Quebec is being used in this way.

In the Keweenaw Peninsula, which juts northward into Lake Superior, there are rich copper mines. Another part of the Central States which produces valuable minerals is the Ozarks, where lead and zinc are mined. In Michigan there is an enormous limestone quarry on the shore of Lake Huron. From there large shiploads of stone are carried

eastward to the iron and steel plants. Other limestone quarries, in Indiana, are famous for their beautiful building stone.

A great industrial region • We must not think of the Central States as being a region of rich farms and mines only. It is also part of the largest manufacturing region of the United States which stretches from the Atlantic coast near New York well into the State of Wisconsin.

What industries are carried on in this western part of the industrial region? Because this is a farming area, one of the most important industries is the manufacture of ploughs, harrows, mowing machines, combines, tractors, and all the other equipment needed on a modern farm. The United States is the largest manufacturer of farm machinery in the world, and most of it comes from this area. Here, too, are manufactured the huge

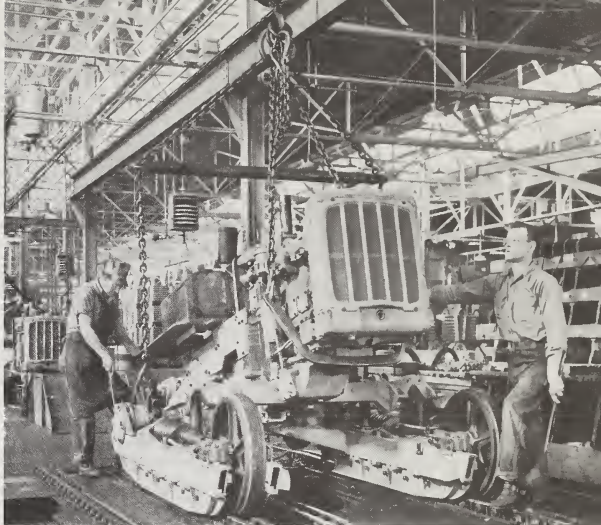
machines that mine iron ore and move earth during road building.

Other large industries in this region use the products from farms and process them for use as food. Most important of all is meat packing, but we must not forget the manufacture of many products from corn, soy beans, wheat, and other cereals. Other local industries are oil refining and the manufacture of pulp and paper.

To carry the products of farms, mines, and factories to where they are needed, there must be good transportation routes. The level lands of the Central States are ideal for building roads and railways, and there are also the Great Lakes and fine navigable streams. Because of this, there are industries which supply the locomotives, automobiles, freight cars, and even the ships needed to move the freight and passengers.

Great manufacturing centres • As we cannot visit all the large industrial cities of this region, we shall select a few that will give us an idea of what all are like.

Chicago. Although Chicago is less than 150 years old, it is now the second-largest city in the United States. Chicago started as a tiny trading post at the southern end of



Caterpillar Tractor Co.

Making tractors in Illinois. Why are so many tractors made in this part of the country?

Lake Michigan, where there was an easy route toward the Mississippi River. That route is now followed by a canal through which boats can pass on the way from the Great Lakes to the Gulf of Mexico.

Chicago grew in importance mainly because of its location. When settlers reached this point from the East, they used to buy their food and other supplies there before going farther west across the Great Plains.

J. I. Case Company

Long trains loaded with farm machinery are a common sight in the Central States.





Ford Motor Company

An automobile plant at Dearborn, Michigan. Note the steel plant in left background, the sprawling assembly plant, and the excellent railway facilities.

Later, when railways were built, it was a natural meeting place for lines from east, west, and south, and the boats that crossed Lake Michigan. Look at the railway map on page 206 and notice how many railway lines come together at this point. Chicago has been called the "Great Central Market" because so much of the business of the interior plains is carried on there.

Thousands of manufacturing plants in Chicago turn out so many different products that they are almost too many to count. However, foodstuffs, clothing, and furniture are especially important. Every year thousands upon thousands of well fattened cattle, hogs, and sheep are brought by rail and truck to the stockyards, and from the packing plants meat is shipped out to stores in all parts of the country.

Detroit. Detroit, as you probably know, is famous as an automobile-manufacturing centre. It is the leader of a group of cities in southeastern Michigan and neighbouring parts of Ohio and Indiana in which more automobiles are built than anywhere else in the world. But automobile factories, and the many industries supplying parts to them, are simply the best-known of the manufacturing plants. There are thousands of others making

machines, tools, and other iron and steel products.

Cleveland. The greatest of the coal and iron ports on the Great Lakes is Cleveland, which is sometimes called the iron-ore capital of the world. Freighters bring iron ore from west of Lake Superior to Cleveland and nearby ports, and carry coal and manufactures westward on their return trips. As you would expect of a place where iron ore and coal meet, Cleveland has many blast furnaces and steel mills. However, the city is not an iron and steel centre only. There are hundreds of factories turning out manufactured articles to be used locally or shipped to other parts of the country or overseas.

St. Louis. Like Chicago, St. Louis grew in size because of its excellent location. It began as a trading post on the first good camping site south of the point where the Missouri joins the Mississippi River. When steamboat traffic began, it became a leading river port. Later, when railways were built from the West, the Mississippi was bridged at this point, and traffic from all directions met there. Many of its factories use the farm products of the Central Plains. Flour milling and meat packing are important, beer is brewed, hides are made into shoes, and sugar

is refined. The city is also still a large raw-fur market.

Milwaukee. The largest city in Wisconsin is located on the shore of Lake Michigan where railways from the north, south, and west meet ships from all parts of the Great Lakes. With the building of the St. Lawrence Seaway, this city, like Chicago and other lake ports, has benefitted greatly. Grain and other farm products from the West are shipped through Milwaukee, and the making of alcohol from grain is an important industry. The city also has plants which use steel from Cleveland's mills to manufacture equipment for mines and other industries.

The Two Kansas Cities. In the western part of the Corn Belt are two cities of the same name. They are located near where the Kansas and Missouri rivers join. The larger of the two cities is in Missouri and the other is across the river in Kansas. Both have industries which use farm products — flour mills, butter factories, meat-packing plants, and the like.

Minneapolis and St. Paul. These "Twin Cities" are on the Mississippi River in Minnesota. St. Paul grew up where falls in the river led to the building of flour and other mills. Minneapolis also has many mills. Together the two cities form a great industrial, railway, commercial, and educational centre. They are also known as a centre to which settlers from Norway and Sweden came in the nineteenth century to farm this area.

A MATCHING TEST • Four of the most important cities in the Central States are Chicago, Detroit, Milwaukee, and Cleveland. Locate each of these cities on the map on pages 208-209, then answer these questions about them.

1. Which one is an important coal and iron-ore port?
2. Which is the greatest railway centre?
3. Which one is the centre of the automobile industry?

4. Which is an important lake port in Wisconsin?

5. Which one leads in meat packing?

6. Which two are great centres for manufacturing iron and steel?

QUESTIONS TO ANSWER • 1. Why can corn be so successfully grown in some of the Central States? Give at least three reasons.

2. Dairying, rather than the growing of corn, is the chief type of farming in Minnesota and Wisconsin. Why is this so?

3. Why are the cattle of the Great Plains moved east into the Corn Belt for some months before being slaughtered?

4. Why is agricultural machinery manufactured in Corn Belt cities?

5. What local sources of power are there for industries in the Central States?

6. What mineral is found in the Mesabi Range? in Keweenaw Peninsula?

7. What two fuels are found in eastern Kansas?

8. What city is located near where the Missouri and Mississippi rivers join? Why did such a large city grow up there?

THE WESTERN STATES

There are eleven states in this group. Find their names on the map on pages 208-209, and write them in your notebook. Which of them touch Canada? Which touch Mexico? How many of them border on British Columbia?

You will remember that British Columbia has been called a land of contrasts because of the variety of scenery there. The Western States of the United States have even greater contrasts.

In these Western States are the highest and the lowest land in the country. The mountainous regions of British Columbia and Alberta extend southward into these states, and the highest lands are parts of the Rocky Mountains, Sierra Nevada, and Cascade Ranges. Locate these on the map on page 192. The lowest lands are harder to find because they are much smaller. They

include the famous Death Valley and the Imperial Valley, both in California. Both of them are about 200 feet below sea level.

The contrasts in climate are just as great. The map on page 15 shows that parts of the northwestern states are very wet. The coastal areas of northern California, Oregon, and Washington receive from 60 to 100 inches of rain a year. It is in these rainy areas that the largest forests of the country grow. Now locate on the map areas with less than 10 inches of rain in a year. These dry lands are mainly in the western plateau country. Here there is usually too little rain for trees to grow, and huge areas are so dry that they have only a thin covering of bunch grass or other plants able to grow with little water.

The Western States region also includes great differences in temperature. Many of the high mountains are extremely cold in winter and some of them are snow-capped even in summer. Some parts of California and Nevada, on the other hand, are warm all year round. This makes them attractive as vacation and health resorts.

Look at the population map on page 197. Most of the West is rather thinly populated, and large parts of it are practically empty; yet there are large cities too, although far fewer than in the eastern states.

Western Canada and the Western States are alike in many ways, especially in the variety of their scenery and living conditions, but there are important differences between the two countries. There are good reasons for the differences.

The mountain wall in the United States and the passes through it are higher than in Canada. This has made railway building much more difficult.

The mountainous country extends farther east in the United States than it does in Canada. The Canadian Rockies, as you know, are far to the west of Regina. But if you were to travel due south from that city you would find yourself within sight of the Rockies in Colorado. This is because there is a very large area of plateaus between the United States Rockies and the ranges nearer the west coast. This Great Basin, as it is

The Grand Canyon of the Colorado River. The river is, in places, almost a mile down from the surface of the plateau.





Where there is enough water, either from rainfall or irrigation, the Western States produce fine crops of vegetables and fruits. Here carrots are being pulled by machinery.

called, is far wider than the Plateau of British Columbia.

Parts of the Western States are drier than any part of western Canada. The high ranges which surround the Great Basin allow little moisture to reach the area. Because it is farther south, the warm season is longer, the days are hotter, and so there is more evaporation. This means that large parts of the Western States are very dry, in some areas so dry as to be deserts.

Settling the West • The search for furs brought the first settlers to the western lands of the United States, but it was the discovery of gold that really opened up the country. The greatest rush of all was that by the "Forty-niners" who in 1849 crossed the country to the California gold fields. Some were lucky and found gold. Many others did not, but remained as farmers, ranchers, sailors, and townspeople. Although the journey was a long and dangerous one, thousands of other people later crossed the

continent or sailed around Cape Horn to reach the rich lands along the west coast.

A ranching region • Look at the map on page 192. Which four of the Western States have a share in the Great Plains? Remember that the driest parts of the Great Plains are those to the west. Where the small rainfall makes farming impossible, the pastures are used for livestock.

Before the white man reached these plains, they were the home of roaming herds of buffaloes. Today most of the open ranges have been fenced in and cattle or horses are raised on the best — which means the wetter — pastures, while sheep and sometimes goats graze where only *scrub*, or coarse tufted grasses, will grow. Because much of the pasturage is poor, a rancher needs a very large piece of land if he is to make a profit. This is the country of the cowboy, the bronco, the rodeo, and the dude ranch.

Blizzards are common in winter in the northern part of the Great Plains. When the

colder weather begins, the cattle must be gathered from the distant pastures and kept where they will be more sheltered from the snow and wind. They are then fed *forage crops*, such as alfalfa and kaffir corn, which can be grown in areas with little rainfall. Farther south, or in places where there are frequent chinook winds to melt the snow, the cattle may be left out all winter. In the fall the cowboys round up the herds, "cut out" or select those animals which are to be sold, and then start them on the long journey eastward to be fattened in the Corn Belt.

The sheep are usually kept in unfenced pastures. They need a nearby stream or other steady source of water. A man with a couple of dogs can generally take care of as many as 3000 sheep. Although herding is a lonely job, it is less so now, since trucks are used to bring supplies regularly and to move the camp when fresh pasture is needed.

As soon as the sun begins to grow hot in June, the sheep are sheared. Men trained in this kind of work go from ranch to ranch carrying with them the electric clippers they use. The work is done very quickly, so that almost before a sheep knows what is happening, it is on its feet again, much more comfortable without the heavy fleece.

Newly-sheared sheep on their way to their summer pastures high up in the mountains.

Library of Congress. Photo by Arthur Rothstun



As the pastures dry up under the hot sun, the sheep start out on their summer journey to fresh pastures high in the mountains. They move slowly, grazing as they go. First they find coarse grass and scrub, then small bushes, and finally trees. As they continue up through the forest, they reach the highest pastures of all, and there they spend the summer. As soon as snow begins to fall on the high peaks, the shepherds gather their flocks together and start once more for the low land where they will spend the winter.

Farming in the West • Look again at the rainfall map on page 15 and recall that while the wettest lands of the United States are in the West, the driest areas of the country are also in this region. Because of this, much western farming must be carried on with the aid of irrigation.

Fertile valleys and irrigation dams of the Southwest. Although rainfall is scarce in many places, there are some very large rivers in the West. On the map on pages 208-209, find the Rio Grande and the Colorado, Pecos, and Gila rivers. All of them, and several smaller streams, are used for irrigation, making possible the use of such very rich farmlands as those of the Imperial Valley, the Coachella Valley, and the Salt River Valley.

To make more water available at the right time, the United States Government has built many dams across rivers in the southwestern states, and has dug canals to carry the water to the fields. Hoover Dam, on the Colorado River, is the largest dam in the Southwest. It lessens the danger of floods, it supplies dependable water for irrigating the dry farmlands, and it also provides electricity for use on the farms, in homes, and in industries. Water from the huge Lake Mead which formed behind this dam is especially important to the fruit and vegetable growers of the Imperial Valley.

The Central Valley of California. Not far from the Pacific coast, in the valleys of the San

The Sierra Nevada divide the forest lands to the west from the desert and scrub lands to the east.

Which side is shown here?



Joaquin and Sacramento rivers, is the largest of the fertile valleys of the Southwest. This is the great Central Valley of California. Streams rush down the western slopes of the Sierras, bringing with them pebbles, sand, and soil that are laid down as sloping fan-shaped plains, known as *alluvial fans*. There is a long line of these fans in the Central Valley. They make irrigation fairly simple, as the water from the mountain streams can be controlled at the top of the fan and sent in any direction desired.

Since irrigated land is always expensive, only valuable crops are grown in irrigated areas. Here the climate is very good for growing fruits, as there is almost continuous sunshine in summer and the winters are usually mild. With irrigation, exactly the right amount of water can be supplied as needed. Much of the fruit is sold fresh, but even more is preserved in one way or another. Large quantities of prunes, peaches, and apricots are dried in the sun, as are grapes which become raisins. Other products are canned or quick frozen, and much of the citrus crop is turned into fruit juices. Other parts of the valley are better known for

growing vegetables, which are either sold in nearby cities or are sent eastward in winter in refrigerated cars.

The Puget Sound Lowland and Willamette Valley. In the northwestern states the climate is rather different from that of California and the dry interior. It is more like that of southwestern British Columbia. While it is mild and often sunny, there is less need of irrigation because rainfall is heavier.

This is another great fruit region, but the fruits are not the same as those produced farther south. This is the great berry region — strawberries, raspberries, and logan berries all do well here. It is also famous for apples, cherries, and plums.

In addition to fruit growing, there is mixed farming too, and livestock and poultry are important. The damp climate provides good pasture for dairy herds.

The Columbia Basin. Farther east than the coastal areas of the northwestern states, there are rather different lands. Here the climate is drier, winters are colder, and there is a particularly rich kind of soil formed on a plateau made of old volcanic lava.

Since there is not enough rain for some



The Grand Coulee Dam on the Columbia River supplies water for irrigation and hydro-electric power for industry.

kinds of farming, this is another irrigated area. Several giant dams have been built on the Columbia and other rivers. The best known and largest is Grand Coulee, which has a lake behind it that stretches northward to the Canadian boundary.

The farmlands on the Columbia Plateau are famous for growing wheat and barley, while fruit is also important where there is enough water.

The Great Basin. Find this large inland area on the map on page 192. Do you remember why it is so dry? Since it is surrounded on all sides by a wall of high mountains, little moisture can reach it from the distant sea. In this it is something like the Central Valley of California, but it is very much larger. As the streams flow down the mountains into the basin, they spread out on the more level ground and each stream deposits its load of

sand, soil, and rock in the form of an alluvial fan. The water then wanders off across the plain, where it sooner or later disappears, either by evaporation or by soaking into the ground. In some places where there were once lakes, there now remain only patches of white salt or *alkali*. Streams with enough water for irrigation are not common, and crops cannot be grown without irrigation.

Salt Lake City is the most important place in this Great Basin area. The farmers around the city use water from the Wasatch Mountains to irrigate fine crops. The principal cash crops are sugar beets, wheat, vegetables, and fruits.

Close to Salt Lake City is the famous Salt Lake. The water is so salt that swimmers can float in it easily. This lake is the remains of a larger lake, most of which disappeared as the water evaporated in the hot sun.

Forests and lumbering • Knowing that there are fine forests in British Columbia, you will expect that there must be similar forests in the nearby United States. This is so — in fact, this is the most important lumbering region of the country.

The methods used in lumbering and the uses to which the wood is put are much the same as in British Columbia. Notice on the map on pages 208-209 how Puget Sound stretches its long fingers inland. This means that the lumber can be brought to the ocean readily, and along the seacoast in such inlets are many sawmills and woodworking plants.

In addition to the tall straight Douglas firs and other softwood trees of Washington and Oregon, there are giant sequoias which are found on the wet western slopes in some parts of the Sierras. Some of these trees are more than 250 feet high — almost as tall as the highest buildings in some large Canadian cities. The sequoia forests have been set aside as a national park to make sure that they are preserved for people to study and admire in years to come.

Fisheries • Salmon fishing is important along the coast and rivers of Washington, just as it is along the coast of British Columbia. The Northwest leads all other parts of the United States in fishing because of the huge quan-

ties of salmon caught there. Much of the salmon is used in Puget Sound canneries.

Mineral resources • You may remember that gold brought many settlers to the West in the middle of the last century. The West is still a leading part of the country for mining of many kinds. The Rocky Mountain region is a real treasure house of metal ores, chief among them being copper, lead, silver, zinc, and gold. Butte, in Montana, is an important mining centre, with a huge hill of copper ore right in the city. Another mining district is in northern Idaho, in the Coeur d'Alene district, where silver, lead, and zinc are produced. In the Great Basin there are many large and small mines. One famous open-pit copper mine is at Bingham, Utah. The dry area west of the Rockies is also important as a source of uranium.

California is a leading oil-producing state. This has brought many industries to the area, and has provided fuel for the western railways and for ships on the Pacific Ocean. Natural gas from local wells is also important in the industries and homes of Los Angeles.

Manufacturing • For many years after the first settlers reached the West, most of the manufactured articles they used were imported from the eastern states. Then local industries were started, using the raw

At the left is part of the hill in Butte where huge quantities of copper are mined.

By Ewing Galloway, N. Y.



materials found nearby. Minerals were smelted to produce metals, lumber was cut and used for building, canneries were set up near the fruit farms, and, as we know, much of the salmon catch was canned. Where livestock was raised, meat packing became important, and near the wheat fields, flour mills were built.

In recent years a great variety of other industries have been started to supply the growing population. Since the West has oil, natural gas, and immense quantities of water power that can produce cheap electricity, industries needing power have been set up. A good example of this is the making of aluminum, and a more recent one is the production of atomic energy.

During World War II large shipbuilding yards were built. Many aeroplane factories were set up — the dry, sunny climate makes the Pacific coast of California a good place to test new aircraft. Now there is even a large iron and steel plant not far from Los Angeles. The coal needed is hauled 800 miles from mines in Utah, and the ore is imported by sea.

An industry that was attracted to California by the sunny climate is the making of motion pictures. This has now grown into a tremendous industry that employs many work people, as well as the actors we see on the screen.

The warm, sunny climate, which leads people to spend much of their time out of

doors, has also given rise to a sportswear industry, and there are many shoe factories as well.

One problem with many industries in the West is that they are so far from the very large population of the northeastern part of the United States. This means that western goods cannot be sold there at reasonable prices because of the high cost of transportation. However, as the western population goes on increasing, there will in time be enough local people to buy the goods produced.

The West, a tourist and resort paradise • California offers many attractions to tourists, and to those who wish to settle in a pleasant climate when they retire from work. The warm winters and almost rainless summers, together with the beauty of the mountain and coast scenery, are the chief reasons why such people flock to the West.

The West has many other resort areas. In the mountains there are ski resorts, and scattered throughout the Western States are magnificent national parks set aside by the government for the enjoyment of all the people. The most famous of these parks are Yellowstone with its hot springs and *geysers* or natural fountains, Yosemite with its giant sequoias, Grand Canyon National Park with the breath-taking valley of the Colorado River, and Glacier National Park which is joined to Waterton Lakes Park in Canada.

Boeing Airplane Company Photo



The manufacture of aircraft has become an important industry in the West.

*Los Angeles harbour.
This is a man-made
harbour, planned to
attract industries
and increase trade.
Study the picture to
see how many
necessities of
a good port
you can find.*



Los Angeles Chamber of Commerce

SOMETHING TO DO • Divide the class into groups and let each find out what it can about a national park in the West. Try to obtain pictures of these parks. Let each group explain the attractions of the park it has chosen.

Western cities • Although the population of the Western States is far smaller than that of the East, there are large, busy, and beautiful cities. None of the cities are very old, and all are growing rapidly.

Denver. On the map on pages 208-209, find Denver in Colorado. Notice that, although the Rocky Mountains can be seen only a short distance to the west, the city is built on the plains. These plains are very high above sea level at this point; in fact, Denver is often spoken of as "The Mile-High City."

Denver first grew up as a gold-mining centre. Today its location is of greatest importance, for it is the chief business centre of the Great Plains and a gateway to the drier lands west of the Rockies.

Los Angeles. Half a century ago, Los Angeles was still a small town. It has grown so rapidly that today there are more than

four million people living in and around the city. The name Los Angeles reminds us that it was once a Spanish village. Later it became the centre of a district where oranges, lemons, grapefruit, and walnuts were grown under irrigation. As the town was not on the sea-coast, it had no harbour, and it was without coal or other power for manufacturing.

Then oil was discovered nearby. The cheap fuel soon brought many industries and the town began to grow. Los Angeles became a seaport when its people bought a long, narrow strip of land connecting the city with San Pedro on the coast. There a modern harbour was built.

Two other reasons for the rapid growth of Los Angeles we already know. One is the warm, sunny climate, and the other the movie industry, which has made the name of a Los Angeles suburb, Hollywood, world famous.

Although Los Angeles has many advantages, as we have already read in this chapter, it has two serious disadvantages. One is the shortage of water, which must be piped hundreds of miles from the Colorado River.

The other is its distance from hydro-electric power developments. Electricity must come to the city by power lines all the way from Hoover Dam.

San Francisco. Although only 400 miles from Los Angeles, San Francisco is a completely different kind of city. To begin with, even the climate is not the same. Summers are rather cool and often foggy, and chill winds at times blow inland from a cool ocean current that flows just offshore. This is sometimes an advantage because San Francisco is cooler in summer than the very hot surrounding areas of California and the interior.

San Francisco has a fine natural harbour built on a large inlet of the sea. Its entrance is known as the Golden Gate. Some of the city's industries make use of raw materials that are brought in through the port, but most use the resources of the area to produce food, clothing, and similar goods needed by the

local people. Ship-building, aeroplane manufacturing, and oil refining are also important.

The Pacific coast of California is shaken by earthquakes from time to time. The most famous was at San Francisco in 1906. Modern buildings in the city are now made so that they cannot be easily damaged should there be another severe "quake."

All around San Francisco Bay there are smaller cities which grew up at outlets of the farming area of the Central Valley or at the western end of railway lines. Because of its location, the San Francisco area is an important shipping and air centre for routes across the Pacific Ocean.

Seattle. Still farther north on the Pacific coast is the shipping and industrial city of Seattle. Seattle's location is something like that of Vancouver. It has a fine harbour on Puget Sound, sheltered from the open ocean. Here railway lines from the East exchange goods with ships. As well as being a busy seaport, Seattle is a great lumber and wood-working city, a centre for canning fruit and salmon, and a base for supplying goods needed in Alaska.

San Francisco and the surrounding area.



THINGS TO DO • 1. Give as many reasons as you can why fewer people live in the Western States than in the East.

2. Discuss with your classmates some of the reasons why the movie industry is centred in the Los Angeles area. When it began fifty years ago, the main centre was near New York City.

3. Draw an outline map of California and on it show the following: the Sierra Nevada, the Coast Ranges, the Sacramento River, the San Joaquin Valley, the Golden Gate, San Francisco, Mount Whitney, Death Valley, Yosemite National Park, the capital of the state (this is shown on the map on pages 208-209), and the way in which water from the Colorado River probably moves to reach California.

Using different colours for different products, show where citrus fruits, winter vegetables, oil, lumber, movies, and ships are produced.



Photograph by Bradford Washburn

Back from the coast of southern Alaska rise snow-covered peaks down which glaciers move slowly.

A NORTHERN STATE OF THE UNITED STATES

Alaska was the first foreign possession to be taken over by the United States. It was bought from Russia in 1867 and most Americans thought at the time it was a poor bargain. While reading about the state, make up your own mind as to whether it is of value to the United States today.

Alaska is very unlike the rest of the United States. Indeed, it is much more like parts of Canada. Some of it is similar to coastal British Columbia, another part resembles the Yukon, and the far north is much like the tundra of Canada's northland.

Compare the location of Alaska and the Yukon. Notice that much of both areas is the same distance from the equator, but that Alaska extends much farther to the west.

THREE REGIONS OF ALASKA

We must be careful not to think of Alaska as being everywhere alike. There are parts which are as cold in winter as the coldest

parts of Canada, yet other areas have a mild climate much like that of coastal British Columbia.

The southern coastal region · This includes the so-called "panhandle," or southern part of Alaska, as well as the coastal area as far west as Kodiak Island. It is a rugged coast, with deep fiords and steep, forested shorelines. Offshore is a warm ocean current over which the winds blow from the west, giving this area a mild climate in both summer and winter, and bringing a great deal of rain. The heavy rains make possible the splendid forests, which give rise to a lumber industry and to mills which make paper and pulp.

Not far inland there are several sheltered and fertile valleys where farming is carried on. The best known of these is the Matanuska Valley, where vegetables — chiefly cabbages, lettuce, peas, and turnips — are grown, some fruit and a little grain is produced, hay is harvested, and there is a small but useful



Photo from Three Lions

An Alaskan farmer and his family harvesting the potato crop from their garden.

dairy industry. The growing season is short, of course, and conditions are not so good as farther south.

The central region • This includes the valley of the Yukon River and the high inland plateau. No warm winds from the Pacific Ocean reach this area, and the climate is one of extremes. Winters are bitterly cold; summers are short but warm, sometimes even quite hot. Although trees do not grow very

A catch of Alaska salmon has just been loaded into the boat which will take it to a cannery.

Jan Walsh from Black Star



large this far north, grass grows well and provides pasture for reindeer brought here from Russia long ago. There is some farming, especially close to the city of Fairbanks, but most of the food eaten by the local population must be imported.

The northern tundra • This is the truly arctic part of Alaska, well north of the tree line. The Seward Peninsula, which borders Bering Strait, is only about forty miles from the Soviet Union.

The only permanent residents of this region are the Eskimos, some of whom live as trappers and others as guides or workmen at government centres. Near Point Barrow a long search has been carried on for oil. There is probably a large oil field there but it is at present too far north to be useful.

ALASKA'S RESOURCES

Mining • The Klondike gold rush that opened up the Yukon more than fifty years ago also brought many settlers to Alaska. Today most of the gold mining is done by a few companies which use large, powerful dredges to separate the gold from the gravels. Lode mining is carried on in the coastal region near Juneau. Other mines have at one time produced copper, lead and silver. Oil is being produced and piped to Fairbanks.

Wealth from the sea • Alaska's greatest wealth is probably from the sea. The salmon-fishing industry of the southwestern coast is much like that of British Columbia. Most of the canned fish is shipped south to Seattle and needed supplies are brought north in return.

Another product of the sea, seals, are hunted on the Pribilof Islands in Bering Sea. Unlike the seals of the Atlantic, which are valued mainly for their fat and their skins, these seals of the Pribilof Islands are hunted for their beautiful fur. The catch is shared among the United States, Canada, Japan, and the Soviet Union, and great care is taken to prevent too many seals from being killed.

Beautiful scenery • The coastal and mountain scenery of Alaska is beautiful and attracts many tourists in summer. Most of them go by ship from Seattle or Vancouver. Some continue inland over the excellent motor road that leads to Fairbanks. A railway also links Fairbanks with Seward on the coast.

ALASKA'S FUTURE

The more than 200,000 people who live in Alaska had often asked to be admitted to the United States as a state. This request has now been granted, although the country is at present still not able to support itself. Much of the wealth today comes from the money spent there by military forces and other branches of the United States Government. Attempts to encourage farmers to settle there have not been very successful, and although there is a good demand for labour in summer, there is usually not enough to do in the long, cold, and in some areas dark winters.

During World War II the Alaska Highway was built from Dawson Creek in British Columbia, through the Canadian Yukon and part of Alaska, to Fairbanks. The Canadian

part is now kept up by the Canadian Army. It is a popular route of travel to Alaska in summer and is also open in winter. However, most freight to and from the territory still goes by steamship along the sheltered Inside Passage.

For many years air routes have linked the United States and Japan by way of Alaska and the Aleutian Islands. More recently an air route has been established using Alaska as a stop-over on the way from Western Europe to Asia.

THINGS TO DO • 1. Find out which Alaskan city is the capital (it is shown on the map on pages 6-7). In which region is it located?

2. In an encyclopedia or other reference book, find what information you can about the seal herds on the Pribilof Islands. Why is the catch shared among four nations?

3. Make an album of pictures of Alaska. Try to include some of scenery, wildlife, industries, and the native people. Arrange your pictures by regions.

4. Although an arctic land, Alaska has many volcanoes. One area is known as "The Valley of Ten Thousand Smokes." Learn from reference books what you can about these volcanoes and others on the Aleutian Islands.

How close is the Soviet Union to Alaska? The island in the foreground belongs to Alaska, that in the background to the Soviet Union.

U.S. Air Force Photo



AREA AND POPULATION OF THE PROVINCES OF CANADA

CENSUS OF 1961

	Area in Square Miles	Population		Area in Square Miles	Population
Alberta	255,285	1,331,944	Quebec	594,860	5,259,211
British Columbia	366,255	1,629,082	Saskatchewan	251,700	925,181
Manitoba	246,512	921,686	Northwest Territories		22,998
New Brunswick	27,985	597,936	Franklin	549,253	
Newfoundland (island)	42,734	457,853	Keewatin	228,160	
Labrador	110,000		Mackenzie	527,490	
Nova Scotia	21,068	737,007	Yukon	207,076	14,628
Ontario	412,582	6,236,092	<i>Total</i>	3,843,144	18,238,247
Prince Edward Island	2,184	104,629			

PLACES IN CANADA HAVING 12,000 OR MORE PEOPLE

CENSUS OF 1961

Newfoundland		Mont-Royal	21,182	Kingston	53,526
Corner Brook	25,185	Outremont	30,753	Kitchener	154,864*
St. John's	90,838*	Pierrefonds	12,171	Leaside	18,579
Prince Edward Island		Pointe-aux-Trembles	21,926	London	181,283*
Charlottetown	18,318	Pointe Claire	22,709	Mimico	18,212
Nova Scotia		Pont-Viau	16,077	New Toronto	13,384
Dartmouth	46,966	Quebec	357,568*	Niagara Falls	22,351
Glace Bay	24,186	Rimouski	17,739	North Bay	23,781
Halifax	183,946*	Rouyn	18,716	Orillia	15,345
Sydney	33,617	Ste. Foy	29,716	Oshawa	62,415
Truro	12,421	St. Hubert	14,380	Ottawa	429,750*
New Brunswick		St. Hyacinthe	22,354	Owen Sound	17,421
Edmundston	12,791	St. Jean	26,988	Pembroke	16,791
Fredericton	19,683	St. Jérôme	24,546	Peterborough	47,185
Lancaster	13,848	St. Lambert	14,531	Port Arthur	45,276
Moncton	43,840	St. Laurent	49,805	Port Colborne	14,886
Oromocto	12,170	St. Michel	55,978	Richmond Hill	16,446
Saint John	95,563*	Sept Iles	14,196	Riverside	18,089
Quebec		Shawinigan	32,169	St. Catharines	84,472
Alma	13,309	Shawinigan South	12,683	St. Thomas	22,469
Arvida	14,460	Sherbrooke	66,554	Sarnia	50,976
Cap-de-la-Madeleine	26,925	Sillery	14,109	Sault Ste. Marie	43,088
Charlesbourg	14,308	Sorel	17,147	Stratford	20,467
Chicoutimi	31,657	Thetford Mines	21,618	Sudbury	110,694*
Chomedey	30,445	Three Rivers	53,477	Timmins	29,270
Côte-St-Luc	13,266	Valleyfield	27,297	Toronto	1,824,481*
Dorval	18,592	Verdun	78,317	Trenton	13,183
Drummondville	27,909	Victoriaville	18,720	Waterloo	21,366
Gatineau	13,022	Westmount	25,012	Welland	36,079
Granby	31,463	Ontario		Whitby	14,685
Grand-Mère	15,806	Barrie	21,169	Windsor	193,365*
Hull	56,929	Belleville	30,655	Woodstock	20,486
Jacques Cartier	40,807	Brampton	18,467	Manitoba	
Joliette	18,088	Brantford	55,201	Brandon	28,166
Jonquière	28,588	Brockville	17,744	East Kildonan	27,305
Lachine	38,630	Burlington	47,008	Portage la Prairie	12,388
LaSalle	30,904	Chatham	29,826	St. Boniface	37,600
La Tuque	13,023	Cornwall	43,639	St. James	33,977
Laval des Rapides	19,227	Dundas	12,912	Transcona	14,248
Levis	15,112	Eastview	24,555	West Kildonan	20,077
Longueuil	24,131	Forest Hill	20,489	Winnipeg	475,989*
Magog	13,139	Fort William	45,214	Saskatchewan	
Montreal	2,109,509*	Galt	27,830	Moose Jaw	33,206
Montreal North	48,433	Guelph	39,838	Prince Albert	24,168
		Hamilton	395,189*	Regina	112,141

Saskatoon	95,526	Lethbridge	35,454	North Vancouver	23,656
Swift Current	12,186	Medicine Hat	24,484	Penticton	13,859
Alberta		Red Deer	19,612	Prince George	13,877
Calgary	279,062*	British Columbia		Vancouver	790,165*
Edmonton	337,568*	Kelowna	13,188	Victoria	154,152*
Forest Lawn	12,263	Nanaimo	14,135		
Jasper Place	30,530	New Westminster	33,654		

*Metropolitan Area

AREA AND POPULATION OF STATES OF THE UNITED STATES

CENSUS OF 1960

	Sq. Miles	Population		Sq. Miles	Population		Sq. Miles	Population
Alabama	51,609	3,245,806	Maryland	10,577	3,074,860	South Carolina	31,055	2,359,234
Alaska	586,400	224,094	Massachusetts	8,257	5,115,295	South Dakota	77,047	676,738
Arizona	113,909	1,288,433	Michigan	58,216	7,778,220	Tennessee	42,244	3,535,240
Arkansas	53,104	1,771,343	Minnesota	84,068	3,391,348	Texas	267,339	9,488,620
California	158,693	15,506,974	Mississippi	47,716	2,165,064	Utah	84,916	886,926
Colorado	104,247	1,743,516	Missouri	69,674	4,292,982	Vermont	9,609	387,291
Connecticut	5,009	2,516,799	Montana	147,138	669,547	Virginia	40,815	3,903,555
Delaware	2,057	442,891	Nebraska	77,227	1,404,556	Washington	68,192	2,829,871
District of Columbia	69	745,603	Nevada	110,540	282,137	West Virginia	24,181	1,847,936
Florida	58,560	4,886,016	New Hampshire	9,304	600,782	Wisconsin	56,154	3,930,312
Georgia	58,876	3,910,817	New Jersey	7,836	6,039,594	Wyoming	97,914	327,531
Hawaii	6,423	620,346	New Mexico	121,666	943,981			
Idaho	83,557	682,856	New York	49,576	16,655,836	OUTLYING LANDS		
Illinois	56,400	10,005,955	North Carolina	52,712	4,531,834	American Samoa	76	20,040
Indiana	36,291	4,633,395	North Dakota	70,665	627,209	Guam	206	66,910
Iowa	56,290	2,742,753	Ohio	41,222	9,647,079	Pacific Islands under		
Kansas	82,276	2,177,822	Oklahoma	69,919	2,303,408	U.S. Trusteeship	829	540,000
Kentucky	40,395	3,015,967	Oregon	96,981	1,757,691	Panama Canal Zone	549	41,684
Louisiana	48,523	3,233,859	Pennsylvania	45,333	11,239,301	Puerto Rico	3,435	2,353,297
Maine	33,215	961,967	Rhode Island	1,214	841,857	Virgin Islands	133	31,904

Area of the United States 3,615,210 Sq. Miles. Population of the United States 179,323,000 (1960 census)

CITIES IN THE UNITED STATES HAVING 125,000 OR MORE PEOPLE

CENSUS OF 1960

Akron, Ohio	287,592	Grand Rapids, Mich.	175,741	Pittsburgh, Pa.	600,684
Albany, N.Y.	128,011	Hartford, Conn.	161,077	Portland, Ore.	370,339
Albuquerque, N.M.	198,856	Honolulu, Hawaii	289,864	Providence, R.I.	206,352
Amarillo, Tex.	137,083	Houston, Tex.	932,680	Queens, N.Y.	1,802,119
Atlanta, Ga.	485,425	Indianapolis, Ind.	470,464	Richmond, N.Y.	221,029
Austin, Tex.	185,767	Jackson, Miss.	143,960	Richmond, Va.	218,028
Baltimore, Md.	921,363	Jacksonville, Fla.	197,948	Rochester, N.Y.	316,074
Baton Rouge, La.	151,130	Jersey City, N.J.	269,621	Rockford, Ill.	125,955
Birmingham, Ala.	338,569	Kansas City, Mo.	468,325	Sacramento, Calif.	190,699
Boston, Mass.	677,626	Lincoln, Neb.	127,433	St. Louis, Mo.	740,424
Bridgeport, Conn.	155,644	Long Beach, Calif.	323,996	St. Paul, Minn.	313,219
Bronx, N.Y.	1,415,025	Los Angeles, Calif.	2,448,018	St. Petersburg, Fla.	178,088
Brooklyn, N.Y.	2,604,001	Louisville, Ky.	285,688	Salt Lake City, Utah	188,197
Buffalo, N.Y.	528,387	Lubbock, Tex.	128,068	San Antonio, Tex.	584,471
Charlotte, N.C.	200,878	Madison, Wis.	126,301	San Diego, Calif.	547,294
Chattanooga, Tenn.	127,708	Manhattan, N.Y.	1,668,172	San Francisco, Calif.	715,609
Chicago, Ill.	3,516,258	Memphis, Tenn.	491,691	San Jose, Calif.	202,571
Cincinnati, Ohio	487,462	Miami, Fla.	282,600	Savannah, Ga.	147,378
Cleveland, Ohio	869,867	Milwaukee, Wis.	734,788	Seattle, Wash.	550,525
Columbus, Ohio	465,151	Minneapolis, Miss.	481,026	Shreveport, La.	163,777
Corpus Christi, Tex.	165,698	Mobile, Ala.	191,640	South Bend, Ind.	132,100
Dallas, Tex.	672,029	Montgomery, Ala.	133,874	Spokane, Wash.	179,729
Dayton, Ohio	258,196	Nashville, Tenn.	165,406	Springfield, Mass.	173,736
Denver, Colo.	489,217	Newark, N.J.	396,252	Syracuse, N.Y.	215,291
Des Moines, Ia.	207,654	New Haven, Conn.	148,923	Tacoma, Wash.	146,734
Detroit, Mich.	1,655,681	New Orleans, La.	620,979	Tampa, Fla.	270,610
El Paso, Tex.	272,239	New York, N.Y.	7,710,346	Toledo, Ohio	315,643
Erie, Pa.	135,057	Norfolk, Va.	272,908	Tucson, Ariz.	209,305
Evansville, Ind.	140,474	Oakland, Calif.	361,082	Tulsa, Okla.	258,563
Flint, Mich.	194,940	Oklahoma City, Okla.	317,542	Washington, D.C.	745,603
Fort Wayne, Ind.	160,883	Omaha, Neb.	300,674	Wichita, Kans.	254,262
Fort Worth, Tex.	353,388	Paterson, N.J.	141,385	Worcester, Mass.	186,247
Fresno, Calif.	133,062	Philadelphia, Pa.	1,960,036	Yonkers, N.Y.	189,242
Gary, Ind.	177,913	Phoenix, Ariz.	430,459	Youngstown, Ohio	165,709

Index and Pronouncing Word List

KEY. ä as in can; ā as in cane; a as in father; ě as in bet; ē as in be; e as in mother; ĩ as in hid; ĩ as in hide; ō as in not; ō as in note; o as in horse; ū as in us; ū as in use; u as in burn; ōō as in foot; ōō as in moon; th as in thin; ꞥh as in then; zh as in treasure and z in azure.

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